

# THE MEDICAL JOURNAL OF AUSTRALIA

VOL. II.—9TH YEAR.

SYDNEY: SATURDAY, JULY 22, 1922.

No. 4.

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### THE DEVELOPMENT OF THE HUMAN DENTAL MECHANISM; THE SIGNIFICANCE OF THE DECIDUOUS TEETH; ORTHODONTIA AS AN AID TO PÆDIATRICS.<sup>1</sup>

By W. STANLEY WILKINSON, B.D.Sc., L.D.S., D.D.S.,  
Lecturer and Demonstrator in Orthodontics,  
University of Melbourne.

The human dental mechanism is one of the most complex structures in the body and the symmetry of the facial bones and at least one of the cranial is largely dependent on its development

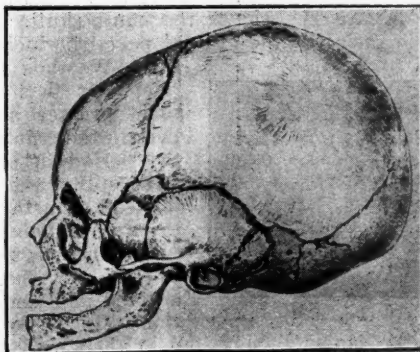


FIGURE I.  
(After Morris.)

and function. The ability to breathe normally, as expressed by the width of the nasal fossæ and the lateral growth of the sphenoid bone which accommodates the *hypophysis cerebri*, are both directly influenced by this development and function; many architectural features of the osseous structure, notably the zygomatic arch and the pterygoid plates of the sphenoid, exist primarily for the purpose of giving origin to the muscles of mastication.

For the genesis of this marvellous mechanism, we shall have to go back to the sixth week of embryonic life, when the stomodæum has separated into the oral and nasal cavities. There are as yet no centres of ossification in the chondrocranium. At this time, however, certain cells of



FIGURE II.

<sup>1</sup> Read at a meeting of the Victorian Branch of the British Medical Association in conjunction with the Australian College of Dentistry Alumni Society on May 23, 1922.

the epiblast covering the dental arches commence to multiply and specialize, resulting in the formation of the germs of twenty deciduous teeth. Simultaneously, but not before, ossification centres appear in mandible and maxillæ and this some sixteen days before any other part of the chondrocranium commences to ossify. This significant fact, coupled with the well-known shrinkage of edentulous jaws, gives weight to the contention that the teeth themselves as well as their function play a more important part in the story of development than has been realized.

At the twelfth week the germs for those permanent teeth which succeed the deciduous ones, have been given off from the dental lamina, these lying to the lingual side of their predecessors. Some of these twelfth-week germs, the canines, will not erupt for eleven and a half years, lying deep in the bone and exerting a steady force by means of cellular proliferation. It should be noted here that the first permanent molar (six-year molar) is not a succedaneous tooth; nevertheless, Nature considers this tooth so important that it is given off direct from the dental lamina, springing from behind the second deciduous molar at the seventeenth week. In this aspect it is unique, as also in the fact that its crown has commenced to calcify at birth. We shall see later the reasons for this extraordinary care on the part of the Master Architect. The second permanent molar commences to form three months after birth and the third permanent molar in the third year.

Thus at birth (see Figure I.) the jaws contain forty-four teeth in varying stages of growth. It will be seen that the facial region is relatively small. Froriep has estimated its ratio to the cranium to be as 1:8. At birth, however, a new force comes into action to assist the development of the facial region, namely, the action of the muscles attached thereto. The various groups comprised by the masticatory, facial, infrahyoid and supra-hyoid, lingual, palatal and pharyngeal muscles are all gradually brought into vigorous action, more especially when the twenty deciduous teeth have erupted. At five years (see Figure II.) the facial region has enor-

mously increased in volume, its ratio to the cranial region being now as 1:4. It will be noted that the cusps of the teeth lock in a very definite manner.

Observe particularly the first permanent molars, whose development, we remember, was guarded with special care. Note the long mesio-lingual cusp of the upper carefully feeling its way down into the deep central fossa of the lower. You are all familiar with the ball and socket arrangement of the head of the femur with the acetabulum. A similar arrangement of the cusp and fossa of these teeth is the most potent anatomical factor in the normal development of the face, because this arrangement determines the possibility or otherwise of normal occlusion. The next slide gives some idea of the hive of cellular industry present in the jaws of the growing child. The jaw bones are literally full of teeth and growth is taking place in all directions. The maxillary canines lie in their crypts at the level of the floor of the nose and their roots grow upward, extending at the time of their eruption almost to the infra-orbital ridge. In the child of twelve years, the apex of the canine root lies very close to the anterior part of the lateral wall of the nares, the width of which is frequently increased by expansion in the canine region when appliances are used which are capable of root movement.

An examination of any skull will disclose the fact that the apices of the bicuspid and molar teeth are on the same level as the floor of the nose and the expansion of any or all

of them will yield similar results in nasal expansion.

Figure III. shows the adult skull, the ratio of the facial to the cranial part of which is now as 1:2. We thus see that development has been four times greater in the facial than in the cranial region in the period associated with the eruption and function of the teeth. During this period twenty deciduous and thirty-two permanent teeth have developed in bony crypts, erupted and come into function. It is impossible to deny their profound effect in this remarkable increase in the facial region. In this connexion the experimental work of Baker, of Boston, may be quoted. This investigator kept the

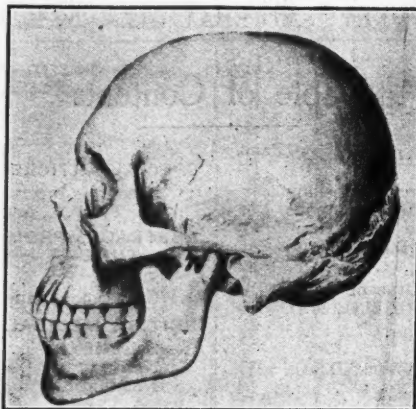


FIGURE III.  
(After Sabotta and McMurrick.)



FIGURE IV.  
(After Broomell.)

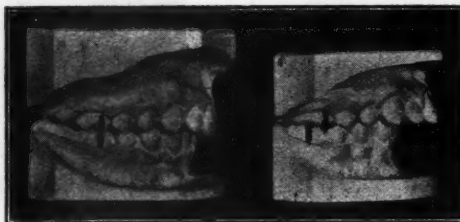


FIGURE V.

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teeth of several young rabbits ground off on the one side, so that mastication was performed unilaterally. The whole litter showed asymmetrical development of the bones of the face and cranium. Landsberger, of Berlin, repeated the experiment on young puppies, except that he removed the tooth germs on one side. His findings were similar. These researches help to explain the marked mental and physical improvement of children who undergo successful orthodontic treatment.

Figure IV. represents an unusually perfect masticatory apparatus, the teeth of which are arranged in what is known as normal occlusion. Observe the wonderful locking of the cusps of the teeth, all part of Nature's plan for efficiency and health. A large proportion of pyorrheal conditions is traceable to the wrong locking of these cusps, resulting in undue strain being placed on certain teeth. We may regard the jaws as two gear wheels, with teeth very carefully machined to fit perfectly. Imagine these same gear wheels, imperfect in form, some teeth not locking at all and others carelessly placed in irregular positions, and you will appreciate the advantage in efficiency of normal occlusion. In order to understand the influence of normal occlusion on facial development we must now consider the dental mechanism in action.

It should be remembered that in youth the glenoid fossa is shallow and allows great mobility to the condyle. Fifteen pairs of muscles are inserted wholly or partly into the mandible. If this bone with its teeth is to assume the position of maximum efficiency in mastication, it is obvious that it will do so only by reason of the perfect balance of these fifteen muscles. To illustrate this point, let us consider what happens to a child who habitually sleeps with the mouth open, due, perhaps, to adenoids. The tongue immediately leaves its normal position against the palate and drops down to the floor of the mouth. The fibres of the *orbicularis oris* and buccinator muscles are on tension and press inwards on the maxillæ. These two factors alone are sufficient to account for the high, narrow vault so

often seen. As regards the mandible the normal tension on those muscles inserted near the symphysis, namely, the platysma, anterior belly of the digastric, mylo-hyoid, genio-hyoid and genio-glossus, is lessened, with the result that the bone tends to assume a posterior position.



FIGURE VI.

Figure V. shows the posterior position assumed in such a case by the mandible and lower teeth. Although the adenoids had been removed, mouth breathing was being continued, owing to the prominent incisor teeth preventing closure of the lips. The failure of many rhinologists to recognize this fact has robbed some of their work of its full value and the influence of the lines of pressure exerted by the teeth when in normal occlusion is not appreciated to anything like its proper extent.

I will now quote some observations on the principles of orthopædics by men with whom you are all familiar. Nicolas Andry, the founder of orthopædics, stated that muscles were the chief instruments in shaping the child's body. Wolff's law of bone transformation is known to you all. The late John B. Murphy, of Chicago, expressed it thus: "The amount of growth in a bone depends upon the need for it." Sir Arthur Keith's statement of Wolff's law is:

"Osteoblasts at all times build and unbuild according to the stresses to which they are subjected." He further believes that in all static deformities the transformation of bone is a direct result of unbalanced muscular action. Wolff also showed that the alterations in bone are just such as will meet the altered lines of pressure. This is precisely what occurs when teeth meet in the wrong way. The unbalanced muscles of mastication transmit pressure to the bones along abnormal channels, either preventing their normal growth or bringing about their deformity.

The important feature in the corrected occlusion (see Figure V.) is that the molar

and bicuspid teeth have been moved into a relationship which is normal, thereby causing the bones to develop normally in accordance with the principles enunciated above.

Figures VI. and VII. represent the facial aspect



FIGURE VII.

of this case. It will be seen that bone transformation and improved muscular balance have undoubtedly occurred. Although adenectomy had been twice performed, the child was still obviously a mouth breather at the commencement of the orthodontic treatment. Owing to the malocclusion it was impossible for her to be otherwise. The training of the unbalanced muscles, combined with the establishment of normal occlusion, resulted in marked physical improvement, evidenced by a definite increase of weight. The improvement in mentality was shown by the difference in the school reports and the æsthetic aspect needs no comment. The two things achieved in this case were (i.) the establishment of an efficient dental mechanism and (ii.) the institution of normal nasal breathing.

It illustrates the value of thorough orthodontic treatment supplementing that by the rhinologist.

I wish now to call your attention to the relationship of a certain type of malocclusion, namely, the high, narrow vault and the *hypophysis cerebri*. Two cases have been reported of abnormal sexual manifestations at the ages of seven and sixteen years respectively, where normality was secured by treatment no other than the expansion of the maxilla and consequent relief of pressure on the vomer by orthodontic measures. The vomer articulates by its superior border with the rostrum of the sphenoid, immediately above which is the deep pituitary fossa. Moreover, this fossa, which so completely encloses the *hypophysis*, is extremely close to the points of origin of two powerful muscles of mastication, the internal and external pterygoids. In these cases, the pterygoids were almost functionless and it is quite reasonable to suppose that the lateral growth of the sphenoid was partly inhibited, thus cramping the *hypophysis* at a time when it may have urgently needed more room.

The expansion of the maxillary bones in these cases would bring about a lowering of the vault, thus relieving possible pressure through the vomer on the rostrum. The main effect, however, would be the increased stimuli transmitted to the pituitary fossa through the agency of the powerful pterygoid muscles, whose function would be restored by normal mastication.

Since the main origin of the pterygoid muscles is

from the lateral plate of the sphenoid, it is evident that their function must also have a profound effect on the width of the choanæ. Clinically speaking, there is a very definite improvement in nasal breathing when normal occlusion is established and I believe that increased function of the pterygoids, caused by more efficient mastication, is the main factor in very many cases.

I must now pass on to the significance of the deciduous teeth. Those of the maxilla are shown *in situ* in another slide, with the first permanent molar erupting posterior to them. It can well be understood that if the second deciduous molar be prematurely lost, the permanent molar will drift forward into

its place. Not only will this prevent the normal eruption of the second bicuspid, but, far worse, the whole occlusal relationship of the teeth and jaws may be upset. The deciduous tooth next in importance is the canine. These may be likened to the

corner stones in an arch of masonry, an arch which is designed to resist the pressure of the *orbicularis oris* muscle. Should either canine be lost, the arch must inevitably collapse, the degree of collapse depending on the tonicity of the muscle.

Unfortunately, these teeth sometimes become septic and the question of their removal has to be decided. It must be stated here that the dental

profession does not stand for the unconditional retention of all septic deciduous teeth. If a tooth can be rendered aseptic, its retention is occasionally advisable, but the majority of septic deciduous teeth have no functional value. Nevertheless, in all such

cases the dentist should be consulted and the precise value of the tooth or teeth ascertained, for this, of course, will vary according to the tooth and the stage of development of the denture.

Before dealing with the subject of orthodontia as an aid to paediatrics, I trust you are fully seized with the fact that the dental mechanism, by virtue of its complexity, is peculiarly liable to derangement. There are thousands of children

in Melbourne whose dental efficiency is less than 50%. As a direct consequence they are not masticating properly and many of them are habitual mouth breathers. Hundreds will grow to manhood and womanhood with the bones and muscles of the face developed asymmetrically and with faces which belie their true characters. Their teeth will eventu-

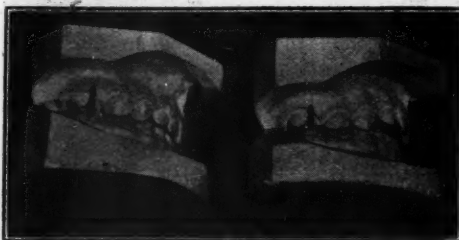


FIGURE VIII.

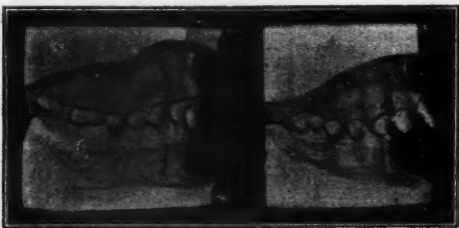


FIGURE IX.



FIGURE X.



FIGURE XI.

ally fall an easy prey to the forceps through the ravages of caries and pyorrhœa. At first blush, the problem seems hopeless, but with a more thorough appreciation of the forces which bring about the establishment of the dental mechanism, I believe much of this deformity can be prevented. The next slide shows an instance of wrongly directed force on the plastic præmaxillary bones, the familiar habit of thumb sucking. Some of the most horrible facial malformations I have seen were caused solely by this pernicious habit. This slide shows the damage already caused at the age of four years. Fortunately an early diagnosis was made and the habit checked. The damage is now gradually being repaired by the normal force of the *orbicularis oris*.

Figure VIII. is of a child of three years and one month presenting a marked gap between the upper and lower incisors on the right side. It will be noted also that the teeth of the mandible have been forced into a posterior position. The cause of this was the habit of biting the knuckle. Elimination of the cause and the use of some very delicate appliances brought about the result shown in a very short period, without any discomfort whatever to the child. As the slide is inadequate, I have brought stereoscopic photographs and models of this case for your inspection. The latter show very beautifully the bony changes in the præmaxillary region. Note that the occlusion in the right molar region has been rendered normal.

Figure IX. shows a case of thumb sucking which was allowed to develop until the



FIGURE XII.

age of twelve years. It was corrected as shown with some difficulty. This horrible deformity was absolutely preventable. It is an example of the criminal practice of many nurses of encouraging a baby to suck his thumb in order to keep him quiet.

Figure X. shows plaster casts of this boy's face before and after correction. The change was so striking that people who had not seen him for some time, often failed to recognize him. His former expression was entirely false, indicating a weakness of character which would undoubtedly have militated against his chance of success in life.

Figure XI. is a photograph of the teeth of another fine lad. The masticatory efficiency of this denture was about 40%. Although the boy was thirteen years of age, his teeth were rapidly placed in normal occlusion, as is shown by Figure XII., where a retaining wire is seen in position. The physical and mental improvement in this boy was dramatic. His weight increased in nine months by 12.7 kilograms; he topped his class at one of our public schools and has done very well at his sports. The slides show very imperfectly the improvement in the facial contour. Stereoscopic pictures are also available.

The next slides show another case of this class. Note that the twelve anterior teeth do not meet and are absolutely functionless. This case is particularly interesting by reason of the fact that it was used as a test for a new method of treatment which bids fair to revolutionize the practice of ortho-

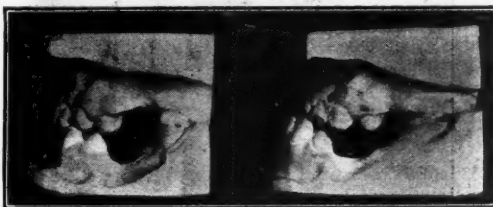


FIGURE XIII.



FIGURE XIV.



dontia. The changes shown in the occlusal relations of the teeth were wrought in the short period of ten weeks. As the teeth complete their eruption, they will all meet in a normal manner and the forces of occlusion will tend to develop the bone along normal lines. Note that the muscles have not yet adapted themselves to their new positions, but the facial balance of this patient is rapidly improving under a course of muscle re-education.

Figure XIII. shows a case of an entirely different kind. It is that of a girl whose lower teeth were biting in front of her upper, instead of just behind, as is normal. The abnormal direction of the forces of occlusion caused an over-development of the mandible and an under-development of the maxillæ in accordance with Wolff's law and the amount being four millimetres. It will be observed that the lower incisor teeth are now in perfect position and that the necessary spaces in the præmaxillary region have been gained. This was accomplished in a very short space of time and illustrates the value of early diagnosis and logical treatment. The old-fashioned idea in cases of crowding was to extract some of the teeth. Had that crime been perpetrated in this case, the development that you see would never have occurred in the bones and the nasal chamber would have been permanently narrowed.

Figure XV. shows a striking case of increase in general health as a result of the establishment of



FIGURE XV..

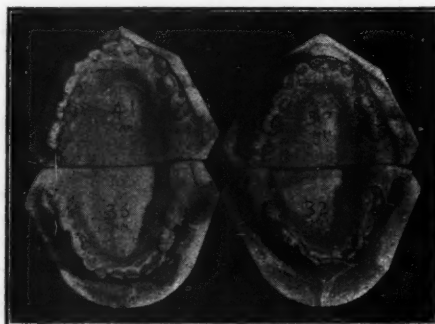


FIGURE XVI..



FIGURE XVII..

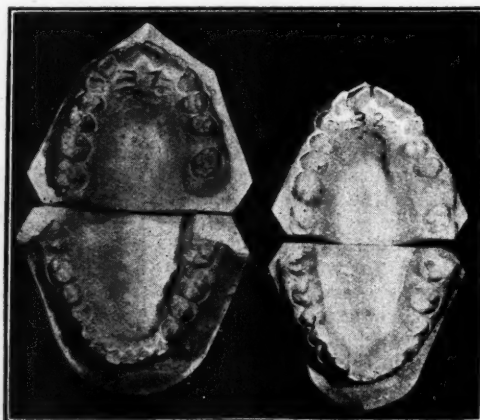


FIGURE XVIII..

normal masticatory function and normal nasal breathing. Although adenoids had been removed by a leading London specialist, the child was still a mouth breather. The explanation was the usual simple one, inability to close the lips on account of the prominent teeth. Note the splendid balance of the face in the case after five months' treatment; also the increase in weight as evidenced by the signs of a double chin.

The next slide (see Figure XVI.) represents the dental models of a little girl of six years whose permanent teeth showed signs of crowding owing to contracted arches. Definite increase of width was secured in both mandible and maxillæ, the amount being four millimetres. It will be observed that the lower incisor teeth are now in perfect position and that the necessary spaces in the præmaxillary region have been gained. This was accomplished in a very short space of time and illustrates the value of early diagnosis and logical treatment. The old-fashioned idea in cases of crowding was to extract some of the teeth. Had that crime been perpetrated in this case, the development that you see would never have occurred in the bones and the nasal chamber would have been permanently narrowed.

Figure XVII. shows still greater expansion of the vault in an older patient.

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Seven millimetres in the maxillary and eight millimetres in the mandibular molar region have been gained. This boy had an unusually active tongue and he experienced great relief from the expansion of the vault, as well as from having his breathing made easier. It will be noted that in this case there was also considerable crowding of the lower incisors. Some time ago a similar case was referred to me, but before the patient presented herself she was operated on for tonsillectomy. The doctor, a well-known man, told the mother that he might as well remove one of the crowded teeth and did so. I can assure you that this is by no means an isolated case and a most emphatic protest must be entered against the removal of teeth by some rhinologists.

Figure XVIII. is another case of crowded teeth which had been unsuccessfully treated for two years by means of obsolete methods. The parents were very much discouraged and the child's nervous system had suffered. The models on the right show the condition when the patient came under my care. The result was accomplished in a little under five months. Note the increase in width in the canine region and, remembering the position of the apices of the roots, picture the effect on the width of the nares. This case brings up a point on which the medical profession has been much concerned, namely, the wearing of appliances over several years. With modern methods of treatment in the hands of a skilled operator this is totally unnecessary, for the correct speed at which a tooth should be moved is the rate of its eruption. In no case shown on the screen have the appliances been worn for longer than nine months, the shortest time occupied being ten weeks. A model has been passed round for your inspection, showing the delicacy of these new appliances. The bands cemented on the teeth are the means by which the force contained in the delicate spring arch is transmitted to the bone through the roots of the teeth. This principle is entirely new, as previously it was the crowns only of the teeth which were moved and not to any appreciable degree at least the roots.

This necessarily brief paper may be summarized as follows:

1. The development of a perfectly functioning dental mechanism or the attainment of normal occlusion is an extremely intricate process, involving many bones and muscles.
2. Gross irregularities of the teeth constitute a serious handicap to the growing child and, unless corrected, will disturb the metabolism of the whole body.
3. The paediatrician and the rhinologist should bear in mind that in many cases a child's well-being can be considerably improved by orthodontic treatment.

Finally, I would remind you that Nature, the master architect, builds every individual according to a plan. The plan of the teeth and associated parts is particularly definite and it is the duty and privilege of the orthodontist to interpret Nature's wishes, earnestly striving by the elimination of all abnormal lines of force for that perfection of function and beauty which should be the heritage of every member of the community.

## THE MANAGEMENT OF DIABETES MELLITUS OF CHILDREN.<sup>1</sup>

By H. BOYD GRAHAM, D.S.O., M.C., M.D. (MELB.),  
Assistant Pathologist, Children's Hospital, Melbourne.

A STUDY of the history<sup>(1)</sup> shows that the scientific treatment of diabetes may be dated back only to the commencement of the present century, although the condition had its name in A.D. 150. The attention of experimentalists has been focussed on the pancreas for some three decades and one brilliant result has been followed by another until it would appear that at last diabetes is nearly understood. However, up till 1914 no notable improvement in the results of treatment had been manifested and the prognosis was bad for adult sufferers and practically hopeless for children. The published accounts of the application of the modern treatment introduced by Dr. F. M. Allen, formerly of the Rockefeller Institute for Medical Research, are full of hope and promise and this new attitude is based on large experience.

Through the courtesy of Dr. S. W. Ferguson and of Dr. H. Hume Turnbull I have had three opportunities of applying the principles of this new method in the management of *diabetes mellitus* of children and I have been invited to discuss some practical details to-night.

### Theory.

It is the current teaching of physiologists that normally the islets of Langerhans of the pancreas supply an internal secretion or ferment which has the function of assisting the conversion of blood-sugar into the colloidal polymer glycogen which is stored in the liver and in the tissues as a local source of energy which is readily available to be used when the tissues do work. My conception of the existing theory of diabetes is that the aetiological factor, an unknown or variable factor, causes the failure of production of this internal secretion. It would appear that the tissues can still utilize some carbo-hydrate from the circulating blood, but a profound metabolic disturbance occurs with the onset of symptoms. When carbo-hydrate is used as the fuel, combustion is complete and the products of combustion—carbon dioxide and water—are easily excreted and the heat of the chemical action forms the energy for the tissue. The maximum amount of carbo-hydrate that can be utilized, is an important constituent of the diet, but carbo-hydrate fed in excess of this amount will accumulate in the blood and be excreted in the urine when the renal threshold for sugar, which is variable for different patients, but is raised in *diabetes mellitus*, is reached. I am not aware that the optimum percentage of blood sugar has been decided, though, on clinical grounds, Joslin<sup>(2)</sup> finds it useful to measure the percentage and to control it by diet at about the figure for normal persons. If this can be done, the patient's urine will not contain an abnormal amount of sugar. The protein of the diet is formed into tissue for growth and replaces waste tissue and it is also an important source of carbo-hydrate. The protein requirements of a normal child of four years are estimated<sup>(3)</sup> to be three grammes per kilogram of body

<sup>1</sup> Read at a meeting of the Melbourne Pædiatric Society on May 10, 1922.

weight, but as age advances this amount gradually decreases. Probably a diabetic child requires more than a normal child. An excess of protein increases the total metabolism of the body and may impair the efficiency of the kidneys and bring about oedema and toxæmia. When a certain amount of carbohydrate is being utilized, a definite quantity of fat can be completely oxidized, but a surplus of fat will be incompletely oxidized and the acetone bodies, which are toxic and may cause coma and death, will be produced.

Your attention is particularly directed to the consequences of the incomplete combustion of fat derived either from the diet or from the fat deposited in the tissues. Bloor<sup>(4)</sup> has shown that an excessive lipid value of the blood is common in diabetes and has introduced a clinical method of estimating blood lipid. Cammidge<sup>(5)</sup> has pointed out the importance

of regulating the fat intake. Joslin<sup>(6)</sup> has suggested that a persistently high percentage of blood fat is of more serious prognostic importance than is a similar percentage of blood sugar and has pointed out that the relation between blood fat and coma has not yet been sufficiently investigated. The absence of acetone bodies from the urine does not prove that these bodies are not present in the blood.

The aim of dietetic treatment is to endeavour to arrange that the patient is supplied with suitable food in sufficient, though not in excessive, quantity to meet the altered conditions arising from the pathological lesion. Apparently this control should be exerted for the duration of the life of the patient.

#### Practice.

The data supplied in the accompanying table (Table I.), which is almost entirely extracted from

Table I.—Data for Use in Management of Diabetes Mellitus.

1 gramme of carbo-hydrate	= 4 calories	30 cubic centimetres	= 1 fluid ounce
1 gramme of protein	= 4 calories	30 grammes	= 1 ounce
1 gramme of fat	= 9 calories	1 kilogram	= 2.2 pounds
30 cubic centimetres of brandy	= 105 calories	1 pound	= $\frac{1}{16}$ kilogram

Food Values in Available Grammes of Carbo-Hydrate, Protein and Fat Contained in Thirty Grammes of Foodstuff, Weighed Uncooked.

Foodstuff.	Carbo-Hydrates.	Proteins.	Fats.	Calories.
Almonds ("15%")	4½	1½	16	168
Apple ("15%-20%")	4½	1½	—	24
Asparagus ("5%")	1	½	—	6
Bacon	—	5	15	155
Beans, French ("20%")	6	2	—	32
Beans, haricot ("20%")	6	2	—	32
Beets ("10%")	2	½	—	10
Brazil nuts ("10%")	3	1	16	160
Brussels sprouts ("5%")	1	½	—	6
Butter	—	—	25	225
Cabbage ("5%")	1	½	—	6
Carrots ("10%")	2	½	—	10
Cauliflower ("5%")	1	½	—	6
Celery ("5%")	1	½	—	6
Cheese, average mild	1	8	10	122
Chicken, young	—	6	1	33
Chicken, old	—	6	5	69
Cocoa, dry	11	6½	8½	149
Cucumber ("5%")	1	½	—	6
Fish, cod, flounder, etc.	—	5	½	25
Fish, trout, etc.	—	6	1	33
Fish, salmon	—	6	3	51
Gelatine, dry	—	27	—	108
Lettuce ("5%")	1	½	—	6
Marrow ("5%")	1	½	—	6
Meat, cooked, lean, no visible fat	—	8	5	77
Mushrooms ("10%")	2	½	—	10
Oatmeal, dry	20	5	2	118
Onion ("10%")	2	½	—	10
Parsnips ("15%")	4½	1½	—	24
Peanuts ("20%")	6	2	10	122
Peas, green ("15%")	4½	1½	—	24
Plasmon, dry	—	24	—	96
Potato ("20%")	6	2	—	32
Pumpkin ("10%")	2	½	—	10
Radishes ("5%")	1	½	—	6
Rhubarb ("5%")	1	½	—	6
Sausage, average	—	5	5	67
Spinach ("5%")	1	½	—	6
Tomato, young ("5%")	1½	½	—	8
Tomato, old ("10%")	3	½	—	14
Turk's cap ("10%")	2	½	—	10
Turnips ("10%")	2	½	—	10
Walnuts ("15%")	4½	½	20	204

One egg contains protein, six grammes; fat, six grammes. All the fat and half the protein is in the yolk.

Thirty cubic centimetres of milk can be regarded as carbo-hydrate 1.5, protein 1 and fat 2, in the absence of more reliable information. Gravity cream is all the cream that is visible on a quart bottle of milk that has stood about six hours in the ice-chest. The milk that is carefully syphoned off can be estimated at carbo-hydrate 1.5 and protein 1 to 30 cubic centimetres and the cream at carbo-hydrate  $1\frac{1}{2}$ , protein 1 and fat 5 to the thirty cubic centimetres.

Broth (clear, strained) placed in an ice-chest overnight and skimmed, beef tea similarly treated, "Bovril," "Marmite" and "Bonox" (one level teaspoonful to a cup of boiling water) can each be regarded as containing no carbo-hydrate or fat, but protein 1 to the thirty cubic centimetres of prepared fluid.

Tea and coffee (without sugar or milk) and water have practically no solid contents and no caloric value.

Six oysters have the composition carbo-hydrate 4, protein 6, fat 1. A small orange contains ten grammes of carbo-hydrate.

Chart for Dietary Records.

Date.	Breakfast.	Forenoon.	Dinner.	Afternoon.	Supper.	Night.	Orders.	Remarks.		
								Carbo-hydrates.	Proteins.	Fats.
								Grms.	Grms.	Grms.
May 10	Celery, 30 Lettuce, 20 Plasmon, 45 Milk, 60 Tea, 180	Broth, 180 Water, 180	Fish, cod, flounder, etc., 60 Plasmon, 45 Milk, 60 Peas, green, 60 Pumpkin, 50 Marmite, 180	Beef tea, 180 Water, 180	Cabbage, 60 Cauliflower, 90 Turnips, 50 Egg, 1 Coffee, 180	Water, 180	"5%" vegetable, 200 "10%" vegetable, 100 "15%" vegetable, 60 Plasmon, 90 Milk, 120 Fish, cod, flounder, etc., 60 Egg, 1 Marmite, 180	6.6	3.3	—
								6.6	1.6	—
								6.0	3.0	—
								—	72.0	—
								6.0	4	4
								—	10	1
								—	6	6
								—	18	—
								28.2	117.9	11
								28.2 grammes of carbo-hydrate = 113 calories		
								117.9 grammes of protein = 471 calories		
								584 calories		
								11 grammes of fat = 99 calories		
								683 calories		
								No sugar. No acetone		

Joslin's "Treatment of Diabetes Mellitus," has been used in my calculations. At the outset of treatment I have reduced the diet until the urine of the patient has been clinically sugar-free. Then a vegetable diet has been gradually increased until glycosuria has been detected in the urine. The estimated carbo-hydrate intake just short of this point has been regarded as the "carbo-hydrate tolerance" and protein in the form of boiled fish or "Plasmon" has been added to the diet and later fat, as lean meat or milk or egg, has gradually been used to build up an optimum diet. It has been noted that when the patient was receiving a mixed diet, more carbo-hydrate than the estimated "carbo-hydrate tolerance" could be included without causing clinical glycosuria. The patients have appeared to benefit as a result of activity, such as walking about rather than lying in bed, and massage and warm clothing have been used to bring about an increased supply of blood to the muscles and peripheral tissues. The children have exhibited unstable temperaments and periods of mental agitation have at times been correlated with the unexpected appearance of clinical glycosuria.

Fluids have not been withheld, but in the presence of polydipsia broths and beef tea have been sparingly administered on account of the protein and fat contents which otherwise may overbalance the diet.

The following are brief notes of the cases of the three patients:

CASE I.—H.B., female, aged seven, was admitted on August 12, 1920. For three weeks she had exhibited polyphagia, polydipsia, polyuria, glycosuria and constipation with languor, prostration and rapid loss of weight. Crying fits, pains in the head and slight sore throat were also mentioned. Previously she had been in good health. Her urine contained 1.6% of sugar and acetone bodies in large quantities. She was very asthenic, but by no means comatose.

Food was withheld for two days, but she was allowed such fluids as weak tea and coffee (without milk and unsweetened), clear strained broth (placed in the ice-chest overnight, skimmed and warmed) and water. She received thirty cubic centimetres of brandy daily until she was getting a moderately sufficient diet and for three days sodium bicarbonate was administered orally to the extent of nine grammes daily, but it was then discontinued. On the day after admission a trace of sugar was detected and some acetone was present in her urine, but the tests all failed to elicit a reaction for the succeeding nineteen days. Twenty-four hours after her urine became sugar-free her "carbo-hydrate tolerance" was estimated by giving her a daily increasing quantity of vegetables and on her eighth day in hospital she took in this low protein fat-free form forty-five grammes of carbo-hydrates (or three grammes to the kilogram of body weight) without the appearance of sugar in her urine in sufficient concentration to be detected by the Fehling reaction.

A mixed diet was then introduced by the addition of sixty grammes of raw scraped beef (covered and warmed) and later of sixty grammes of bread made from casold flour and eggs (protein, twenty-two grammes; fat, six grammes) and of one hundred and twenty cubic centi-



metres of unskimmed milk. In a fortnight her daily diet was approximately sixty grammes of carbo-hydrate, fifty grammes of protein and forty grammes of fat and her urine was clinically free of sugar and of acetone bodies. Her diet was maintained at this level for a week and then acetone bodies were detected in the urine shortly after the addition of four grammes of butter thinly spread on her bread; on reducing the amount of fat and increasing the carbo-hydrate glycosuria resulted (1.5%).

A 50% reduction was made in the diet next day and no glycosuria was detected. The diet was gradually increased and by the end of the week she passed the old limit of tolerance. A week later she again had glycosuria, passing thirteen grammes on the day that her diet was estimated to contain ninety grammes of carbo-hydrate, ninety grammes of protein and fifty grammes of fat, representing seventy calories per kilogram. Another reduction of her diet was made and the urine remained sugar-free until a week later she received carbo-hydrate 120 grammes, protein 65 grammes and fat 40 grammes. Her diet was then maintained at just below this level and all went well for a month, when she developed colitis with pyrexia and spent a week in bed and lost the two kilograms of weight that she had gained. It is of interest to note that during this illness her food tolerance was lowered, to return to its former level in a very short time. For three months she made uninterrupted progress and gained weight steadily at the rate of a kilogram a month. Since then she has had institutional treatment in a children's home with a trained matron in charge and has become healthy and active with firm muscles, but she has not gained in weight. A recent specimen of urine was found to contain 0.75% of sugar. Her diet is controlled and her urine is frequently examined and only occasionally yields the Fehling reaction.

CASE II.—B.B., female, aged three, was admitted on August 16, 1921. Nine weeks previously she had become fretful and drowsy and polydipsia and polyuria were noticed. When admitted a week later to a country hospital, glycosuria was detected. She was dieted and improved and the quantity of sugar was decreasing, but she relapsed, with extreme loss of weight and asthenia. She was very wasted on admission and weighed ten kilograms. Though she had fasted all day, her urine contained 2% of sugar and acetone bodies were present. She was allowed fluids freely and for six days was kept on a low diet consisting of 120 grammes of cauliflower, 120 grammes of rhubarb and 180 grammes of pumpkin with 90 cubic centimetres of skimmed milk. By the sixth day the glycosuria had disappeared and the acetonuria had diminished. Her diet was increased and two days later the acetonuria disappeared. Her "carbo-hydrate tolerance" was estimated to be at least sixty grammes, but she frequently had transient glycosuria while her optimum diet was being decided. She failed to gain weight on an average diet of fifty grammes of carbo-hydrate, fifty grammes of protein and fifteen grammes of fat, representing approximately fifty-three calories per kilogram and yet if more protein, carbo-hydrate or fat were added, her urine would contain either sugar or acetone bodies or both. It was decided that attention should be concentrated on keeping her urine free of acetone bodies and that a border-line diet very low in fat should be maintained. The child has continued to be difficult to feed without the appearance of sugar in the urine, but her weight has increased to 11.3 kilograms. She has been an inmate of the children's home for some four months, but was recently re-admitted to the hospital in poor condition and with 3.1% of sugar and acetonuria.

CASE III.—L.T., female, aged thirteen, was in good health until in March, 1921, polyuria and polydipsia commenced. Medical aid was sought in May and the condition was recognized and treatment along modern lines resulted in the disappearance of the glycosuria for five weeks. Until the end of the year she was fairly strictly dieted though her urine contained sugar. Troublesome constipation, enormous hunger, asthenia and prostration were prominent symptoms. Her weight in May, 1921, was thirty kilograms. She was admitted to the hospital on February 11, 1922, in an emaciated condition. Her weight was twenty-one kilograms. Polyuria, polydipsia and glycosuria were extreme and increased amazingly on a vegetable and protein diet. The usual fluids were freely permitted and large quantities of broth were consumed. Repeated attempts were made to render her urine sugar-free by cutting down her diet and

even by intermittent and by prolonged starvation and yet from 50 to 150 grammes of sugar appeared in the urine in a day. The broth was then suspected and without any other alteration in the management of the patient than a restriction that the broth should not be in excess of one-third of her fluid intake and should be clear, strained broth, placed in the ice-chest overnight, skimmed and warmed, she became sugar-free in six days. The figures are tabulated in the accompanying dietary and urinary record (Table II.). Her average fluid intake for two months was about 5.5 litres and more than half of it was in the form of broth and beef tea. She was weak and oedematous and low-spirited and confined to her bed, although she gained about four kilograms in the two months. Her "carbo-hydrate tolerance" was ascertained after she had become sugar-free to be over thirty-six grammes and she has failed to pass sugar or acetone bodies while eating a diet as valuable as thirty-seven grammes of carbo-hydrate, one hundred grammes of protein and thirty grammes of fat or approximately thirty-three calories per kilogram. She is getting regular massage, is out of bed nearly all day and has lost her oedema and bad temper and takes a very keen interest in her diet. Her thirst and output of urine are diminishing, but she is losing weight, which is presumed to have been retained fluid, for whereas before she became sugar-free her fluid intake exceeded her total output of urine, latterly the reverse is the case.

I am indebted to Dr. W. J. Young, of the Biochemistry Department at the Melbourne University, for the analysis of a sample of the broth that the patient was receiving prior to April 8 and to Miss Young, a demonstrator in the Department, who carried out the examination in duplicate and found the nitrogen percentage to be 0.801, representing a maximum protein percentage of 5.01, and found the fat percentage to be 0.19.

This sample, judging by its appearance after a night in the ice-chest, obviously contained less protein and fat than did many other specimens of the broth supplied to the patient which were not analysed.

In the description of the management of these patients emphasis has been laid on the importance of dietetic measures and the assistance of a reliable person, such as a specially trained nurse, would appear to be a necessity without which even a small degree of success is beyond reach.

General hygienic desiderata are of particular importance to diabetic patients on account of their urgent need of the food that they are able to metabolize, of the serious consequences of over-eating or under-eliminating and of their susceptibility to intercurrent infective diseases. It is desirable that periodic systematic medical examinations should be carried out in order that the onset of renal or cardiac inefficiency or of tuberculous infection would be discovered.

Joslin<sup>(7)</sup> has expressed the opinion that "the dangers attendant upon the use of alkalies in the treatment of acid intoxications far outweigh their advantages." Others have advocated that alkaline treatment should be controlled by the reaction of the urine and should be discontinued if the urine becomes alkaline. Another suggestion is that "balanced salines" should be used until the urine becomes alkaline. Strict adherents to the Allen treatment have discarded the use of alkaline fluids altogether.

By the use of gelatine, cochineal and saccharine an imitation sweet was made by the mother of a patient and greatly relished by the child prior to admission to hospital. It is difficult to make a



Table II. (L.T., aged 13).—To Show that the Protein (and Fat) of Broth, Beef Tea, etc., which were Uncontrolled Prior to April 8, Produced Glycosuria, even in the Absence of Carbo-Hydrate Food from the Diet and that the Protein (and Added Salt) Caused Retention of Fluid and Apparent Gain in Body-Weight.

Articles of Diet and Their Estimated Composition and Value.																				Fluid Intake.				Urinary Record (24-hour Specimens).									
Date.	Dietary Details.										Composition.			Tea, Coffee, Water, etc., Beef Tea.	Protein in 21 (minimum).	Total Intake (24 hours).	Total Output (24 hours).	Specific Gravity.	Acetone Bodies.		Fehling Reaction.	Percentage (Pavy).	Total Output (24 hours).	Weight, in Kilograms (Naked, Fasting).									
	Lean Meat.	Fish.	Plasmon.	Oysters.	Butter.	Casoid Bread.	Milk, Skimmed.	Milk, Un-skimmed.	Orange.	Carbo-hydrate.	Protein.	Fat.	Alcohol.						Value in Calories.	Gerhardt Reaction.					Rothera Reaction.								
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31			
Feb. 15	660	150												32	13.5			250	1620	2020	67	3640	2850	1010	++	++	++	++	0.8	22.8	21		
Mar. 1																			2820	4710	157	7580	4260	1010	++	++	++	++	0.45	19.1	24		
Mar. 2																			780	3840	128	4620	6300	1010	++	++	++	++	0.47	29.6			
Mar. 3																			2160	3540	118	5700	5010	1010	++	++	++	++	0.53	26.5			
Mar. 4	300													10	5			60	1650	4560	152	6210	3840		0	++	++	++	0.40	15.3			
Mar. 5																			690	5340	178	6030	4830	1008	++	++	++	++	0.54	28.0			
Mar. 6	300													10	5			60	480	3930	131	4410	3630	1010	0	++	++	++	0.20	7.2			
Mar. 7	100													3.3	1.7			20	5730	191	5730	6360	1012	++	++	++	++	0.40	28.4				
Mar. 8	200													6.6	3.4			40	480	6330	211	6810	5610	1016	++	++	++	++	0.49	28.5			
Mar. 28																			1320	3030	101	4950	5550	1015	0	++	++	++	0.94	52.1			
Mar. 29																			?	?	?	60*	6420	7050	1012	0	++	++	++	0.53	41.0		
Mar. 30																			?	?	?	60*	6000	5280	1018	0	++	++	++	1.19	62.9		
Mar. 31																			?	?	?	60*	4740	7120	1015	+	++	++	++	0.66	46.8		
Apr. 1	200													6.6	13.4	1		89	?	?	?	60*	7020	7740	1014	0	++	++	++	1.43	110.6		
Apr. 2	200													6.6	13.4	1		89	?	?	?	60*	7440	5310	1020	+	++	++	++	1.30	69.0		
Apr. 3																			?	?	?	60*	6240	5280	1025	+	++	++	++	2.00	106.6		
Apr. 4	300													10	18.3	1.3		125	?	?	?	60*	5100	6600	1015	0	++	++	++	1.08	71.2		
Apr. 5	300													10	18.3	1.3		125	?	?	?	60*	7260	7120	1022	0	++	++	++	1.81	128.9		
Apr. 6	300													10	18.3	1.3		125	?	?	?	60*	8340	7120	1015	+	++	++	++	1.25	89.0		
Apr. 7	300													10	18.3	1.3		125	?	?	?	60*	7680	9240	1015	+	++	++	++	1.43	132.1		
Apr. 8	300													10	18.3	1.3		125	?	?	?	60*	6870	6510	1014	0	++	++	++	0.96	59.0		
Apr. 9	300													10	18.3	1.3		125	?	?	?	60*	5430	3870	1012	0	++	++	++	0.86	25.8		
Apr. 10	300													10	18.3	1.3		125	?	?	?	60*	5880	3570	1008	0	++	++	++	0.18	6.4		
Apr. 11	600													20	25.5	5.7		233	1440	2580	86	4020	5220	1006	0	++	++	++	0.10	5.2			
Apr. 12	300	150												20	15	2.5		162	960	3300	110	4260	4680	1008	0	++	++	++	0.04	1.8			
Apr. 13	300	200												23.2	8	2.5		125	1200	2940	98	4140	5280	1006	0	++	++	++	0.04	2.1			
Apr. 14	300	200	90											36.7	13.5			200	1760	1380	46	3140	4140	1008	0	++	++	++	—	—			
Apr. 15	300	200												33.2	13	0.5		145	1860	1260	42	3120	5010	1010	0	++	++	++	—	—			
Apr. 16	200	250												23.2	19.9	1.2		183	2400	720	24	3120	5160	1008	0	++	++	++	—	—			
Apr. 17	200	250												23.2	24.9	1.7		207	1740	1920	64	3660	6510	1006	0	++	++	++	—	—			
Apr. 18	200	150	50											24.1	26.3	6		254	1440	1080	36	2520	6480	1006	0	++	++	++	—	—			
Apr. 19	200	150												29.1	73.8	9		493	2760	1560	52	4320	6480	1008	0	++	++	++	—	—			
Apr. 20	150													33.1	106.3	23		863	1440	1200	40	2640	4710	1010	0	++	++	++	—	—			
Apr. 21	200	150	60											33.1	104.8	30		882	1320	1200	40	2520	5610	1005	0	++	++	++	0.06	3.3			
Apr. 22	200	150	60											22.6	91.8	21		647	1440	1440	48	2880	5970	1006	0	++	++	++	0.26	15.5			
Apr. 23	200	150												26.6	83.8	8		514	1320	2040	68	3360	7230	1001	0	++	++	++	—	—			
Apr. 24	300	150												26.6	92.8	24		693	960	1560	52	2520	?	1020	—	++	++	++	—	—			
May	3	200	150																													23.6	

child lose the sweet taste and such a substitute is perhaps admissible as a slight recompense for foregoing more harmful sweet articles of food which are desired by children.

When preliminary steps have been completed for the estimation of the dietetic regime best suited to the patient, there is perhaps a danger of deprivation of essential minerals or vitamins during the ensuing months or years. It is reasonable to suppose that if a variety of vegetables is included the mineral deficiency would be avoided and by the careful use of uncooked eggs and fruit juice and such a yeast preparation as "Marmite" in addition to the usual articles avitaminosis is unlikely to develop.

#### Prognosis.

In August, 1919, Horowitz, of New York,<sup>(1)</sup> reported that two patients who became diabetic at the age of two years and two years and eight months respectively, were progressing satisfactorily two and three years afterwards and expressed the opinion that "diabetes in children is not necessarily fatal, as we have been led to believe" and the further opinion that "if they can be tided over for a certain length of time, they will outgrow the tendency entirely." In addition, he emphasized the value of institutional over home treatment.

By means of the information available in the records of the Children's Hospital, Melbourne, supplemented by private inquiry, the following particulars respecting an additional five juvenile diabetic patients can be supplied:

CASE IV.—K.H., male, aged thirteen, was admitted on November 2, 1918. For a year he had been diabetic and loss of weight and frequency of micturition were the prominent symptoms. During the two months he was in hospital he responded well to modern methods of treatment and picked up information which it might reasonably be expected would have proved sufficient to enable him to continue the treatment at home. He "gradually sank after leaving the hospital and died on November 13, 1919."

CASE V.—J.B., male, aged four, was admitted on August 1, 1918. The onset four weeks previously was acute, with pyrexia and vomiting, followed by frequency of micturition and enuresis, polydipsia, headache, supra-umbilical pain and nausea. Clinical glycosuria was found to be present, but he became aglycosuric and remained so for three months in hospital while he was strictly dieted; he, however, relapsed and died of coma a month after he returned to his home.

CASE VI.—M.W., female, aged two years and eight months when she was admitted on August 12, 1918. She was not at all drowsy or severely wasted, but her urine contained 3% of sugar and for three weeks she had been languid and irritable with polyuria, polydipsia, polyphagia, constipation and some loss of weight. She was in hospital until November 5, 1918, and for some time after her return to her home her people "had great hopes of her getting well, as she seemed to get stronger and put on a little flesh," but she suddenly developed coma and died shortly afterwards, in March, 1919.

CASE VII.—A.S., male, aged twelve, was admitted on August 29, 1919. He had been the subject of periodical attacks of vomiting for many years, with an interval of about six weeks between the attacks, which on occasions lasted three days. A month before admission polydipsia and polyuria, with nocturnal frequency, had been manifested for the first time and had persisted, with progressive wasting and languor. An attack of "influenza" had ushered in these symptoms, but no other previous illnesses were mentioned. During the month in hospital it was established that he had *diabetes mellitus*, but he did not put

up with dietetic restrictions with a good grace, though he showed some improvement. Shortly after discharge he was admitted to another hospital, where he remained for three months and progressed satisfactorily. "When the cold weather started he commenced to go back and gradually got worse until he died" on August 13, 1920.

CASE VIII.—L.H., male, aged twelve, was admitted on September 27, 1920, three weeks after the onset of illness, with drowsiness and fainting turns; polyuria, polydipsia, polyphagia and rapid wasting had followed and on admission he was rational, but somewhat torpid and the smell associated with acetone was noticed in his breath and his urine contained an abnormal amount of sugar. He remained in hospital until January 18, 1921, and made great progress and learnt how to estimate and record his diet and how to test his urine. After discharge "he was very much better for a few months," but he relapsed and died in October of last year.

These children improved in hospital, responding to modern methods in an encouraging manner. Those that are dead, died away from hospital, beyond the control of the practitioner who had investigated the dietetic condition. It would appear that a greater degree of liaison between the adults concerned in the management of juvenile diabetic patients might be the means of improving the prognosis.

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- (6) Joslin, E. P.: "Oxford Medicine," Volume IV., page 146.
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## Reports of Cases.

### DIPHThERITIC VULVITIS.<sup>1</sup>

By F. A. MAGUIRE, D.S.O., M.B., CH.M. (SYD.),  
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The following cases are thought worthy of record on account of the rarity of the condition:

I. M.R., *etatis* five, was admitted to the Royal Prince Alfred Hospital on April 18, 1920, with the provisional diagnosis of *cancerum vulvae*. The history obtained from the mother was that the child had been ill for three weeks. The mother first noticed little white ulcers on the vulva. The local medical practitioner prescribed a lotion which was used for a day or two and then the vulva began to swell and the use of the lotion was suspended. The condition became worse and the child was taken to the outpatient department of a metropolitan children's hospital and was kept under observation and treatment there. Finally she was sent by the Board of Health for admission to the Royal Prince Alfred Hospital.

On admission the general condition of the child was very bad. She looked extremely ill, the temperature was 37.3° C., the pulse was 114 and the respirations numbered twenty-six per minute. There were several areas of ecchymosis over the back and thighs. The vulva was severely

<sup>1</sup> Read at a meeting of the New South Wales Branch of the British Medical Association on June 9, 1922.

inflamed. The inflammatory area spread on to the anterior abdominal wall for about five centimetres, was brawny and had a dark red appearance. The surface of the *labia majora* was nearly black and was partly covered by a greyish slough. The affected area bled easily. Examination of the circulatory and respiratory systems revealed nothing abnormal beyond a rapid pulse rate. There was no sign of inflammation in the throat. The voice was noticed to be of peculiar quality. The pupils were equal and reacted to light and accommodation. The knee-jerks were present and there was no evidence of any limb paralysis. The tongue was coated with white fur. The child vomited two or three times after admission.

A provisional diagnosis of *cancerum vulvæ* was made by the admitting officer. I was asked to see the patient because foul play was suspected on account of the bruising of the back and the inflammatory condition of the vulva. On inspection, however, the presence of diphtheria was suspected. A swabbing from the vulva was taken at once and the Klebs-Loeffler bacillus was found to be present in great numbers, both in swabbings and afterwards in cultures.

An injection of 10,000 units of diphtheritic antitoxin was given subcutaneously in the abdominal wall. The dose was repeated on the following day and the child was transferred to the Coast Hospital, where she died within twenty-four hours.

II. F.M.B., *ætatis* five, was admitted to the Royal Prince Alfred Hospital on March 2, 1921. The mother stated that the child had had a vaginal discharge for three weeks. She had been seen a fortnight previously at the Children's Hospital, where a smear had been taken and no diphtheria bacilli had been found. The child gradually got worse.

At the time of admission to the Royal Prince Alfred Hospital there was intense inflammation of the vulva and the surrounding parts spreading on to the anterior abdominal wall. Several ulcerated areas were present, the whole of the latter being covered with a dirty grey exudate. A swabbing was taken on serum agar. This failed to show the presence of gonococci, but revealed that of the Klebs-Loeffler bacillus. An injection of 10,000 units of anti-diphtheritic serum was given into the abdominal wall and the patient was transferred to the Coast Hospital, where recovery ensued. There was no evidence of throat infection in this case.

Diphtheritic vulvitis is rare. There is only one case recorded in the Royal Prince Alfred Hospital since 1910. It may occur as a secondary condition to diphtheria of the throat, but when it occurs, as it did in the two cases reported, as an infection of the vulva only, it is liable to be missed. In any case of membranous vulvitis swabbings should be examined for the Klebs-Loeffler bacillus. The cases recorded were diagnosed on the general surgical principle that when a wound or an ulcer is not reacting to ordinary treatment, diphtheritic infection should be suspected, particularly if there is a membranous exudate present.

## Reviews.

### THE SURGERY OF THE STOMACH AND DUODENUM.

A book entitled "The Surgery of the Upper Abdomen," by Deaver and Ashhurst, should be very welcome to the medical profession. At the same time, we must protest that slovenly English is not essential to good surgery. Man has one abdomen. Terms like "upper abdomen" and "the acute abdomen" should be banished from our literature. The difficulties of diagnosis of lesions in the organs situated in the upper regions of the abdomen are great. As a result there appears to be a tendency among some surgeons to recognize this and to limit their work to a segment of the abdomen. The authors have drawn freely on their large surgical experience; many cases are quoted

from their own practice and this has tended to make a very practical treatise.

The chapters on the anatomy and physiology are most pertinent. The authors, in dealing with diagnosis, point out the danger of accepting the unsupported evidence of X-ray examination. They hold that, unless the radiologist is an expert at his work, his report must be accepted with caution and must be confirmed by clinical evidence.

The authors in the past have advocated gastro-enterotomy in the treatment of chronic gastric ulcer, because of its low death rate and satisfactory immediate results, but they are apparently not satisfied with their ultimate results, especially when the ulcers are situated beyond the usual pyloric portion. They state that they adopt excision or even partial gastrectomy much more frequently than they did a few years ago. Transgastric excision of chronic ulcer of the posterior wall is described in detail. We hold that this operation should be relegated to the surgical dust-heap. It is much easier and safer to approach this type of ulcer by a direct attack on the posterior wall of the stomach by the intercolo-epiploic route or by performing a partial gastrectomy.

Attention is drawn to the frequent occurrence of acute dilatation of the stomach and duodenum after operations and many hypotheses are postulated as to its cause. Though nothing new has been evolved, the prominence given to this subject should serve to focus the minds of surgeons on this malady so that post-operative distress due to this cause may be alleviated by the proper treatment.

As might be expected from the senior author's vast experience in gall bladder surgery, the chapter on this subject is most interesting and instructive.

The authors believe in early operation for cholelithiasis and agree with Kehr that the slight dangers of early operation stand in no sort of relation with the great dangers of the disease itself. They do not agree with indiscriminate cholecystectomy, because they attribute a definite function to the gall bladder, yet they apparently perform this operation much more frequently now than in the past.

In the treatment of hydatid of the liver "formalization" of the cyst by 1% formalin after the method of Quénu is insisted on as a preliminary to operation, because the authors believe that the contents of a cyst are infective and can reproduce the original condition. The chapters on spleen and pancreas contain much valuable information.

The book can be recommended on account of the well-balanced judicial and experienced views on the choice of operations and on the value of the different methods of treatment, whether medical or surgical, and because the authors indicate clearly the significance of the various symptoms and signs.

The book has a great many beautiful illustrations, a number of which are in colour, and is destined to be a classic in American surgical literature. The surgeon or practitioner may with confidence consult its pages to help him out of the surgical difficulties which he is sure to encounter when dealing with lesions situated in the upper regions of the abdomen.

### PSYCHOLOGICAL MEDICINE.

DR. BORIS SIDIS'S "Diagnosis of Psychopathic Disease" is one of a number of works by the same author dealing with mental diseases from a psychological point of view. The author writes forcibly, very forcibly at times, on controversial subjects, especially when he crosses swords with the psycho-analysts. For example, in his introduction he writes: "Psycho-analysis is a conscious and more often a subconscious or unconscious debauching of the patient. Nothing is so diabolically calculated to suggest sexual perversion as psycho-analysis." Again, he describes it as a form of medical Bacchanalia, "a mad medical dance of psycho-analytic worshippers round the shrine of Venus and the altar of Priapus." Although this language may be described as hyperbolic invective, yet the author is only

<sup>1</sup> "Surgery of the Upper Abdomen," by John B. Deaver, M.D., Sc.D., LL.D., F.A.C.S., and Astley Paston Cooper Ashhurst, A.B., M.D., F.A.C.S.; Second Edition; 1921. Philadelphia: P. Blakiston's Son & Company; Royal 8vo., pp. 832, with nine coloured plates and 198 other illustrations. Price: \$14 net.

<sup>1</sup> "Symptomatology, Psychognosis and Diagnosis of Psychopathic Diseases," by Boris Sidis, A.M., Ph.D., M.D.; 1921. Edinburgh: E. & S. Livingstone; Post 8vo., pp. 448. Price: 21s. net.



a little in advance of the growing opinion of the profession as to the disabilities, if not dangers, of the teachings and practice of the Freudian school. For instance, F. L. Golla, in his Croonian Lectures of 1921, speaking of the psycho-analytic method, said: "Whether its application in the field of medicine has yielded advantages outweighing its manifest drawbacks is a question about which there is much difference of opinion"; and, again, in considering the difficulties of inquiry by methods of association, he said: "The chief cause of error in such investigations must always be the possibility that the subject derives his associations, not from endogenous sources, but from the investigator."

Boris Sidis is, however, on quite safe ground when he writes: "Our medical colleges are apt to run in a routine; they give special courses in ophthalmology, otology, in special nervous organic diseases and even in tropical maladies which a general practitioner may not see in a lifetime, but they ignore psychopathic maladies which almost crowd the office of the general practitioner, which he finds not only difficult to treat, but is even unable to recognize and diagnose."

One drawback to specialization in medicine is the temptation to invent new names and so to tax still further the already over-burdened memories of students. Boris Sidis is apparently a ready victim to this form of temptation and "psychognosis" is only one of the many new terms made to do duty in this work.

The writer is on the whole clear in his expositions and drives home his points with perhaps a worrying tendency to repetition. He goes with great detail into what he terms the "hypnoidal twilight state" and his methods bear a strong resemblance to those of the school he so much abhors.

The author's description of his views on the origin of hallucinations is very exhaustive and extremely interesting, as is his association of hallucinations with dreaming; he promises to discuss dreams even more fully in a projected volume on the "Causation of Mental Diseases."

He goes very fully into the genesis of everything he touches, e.g., the aphasias, amnesia, etc.. This volume is of very great value to the student of psycho-therapy and shows much original thought and patient investigation. It is to be regretted it is printed on rather poor paper, though there are very few errors in typography.

#### CLINICAL LESSONS IN MEDICINE.

The acceptability of Dr. H. Letheby Tidy's "Synopsis of Medicine" to a wide circle of readers is evidenced by the need to issue a second edition within about eighteen months of the first.<sup>1</sup> The writer is a master of the art of synoptic presentation and has expended a vast amount of careful labour on the work. His book provides a means of rapid reference to the leading features of any medical condition. They are found under the appropriate headings, clearly and briefly summarized.

Naturally within the limits of this comparatively small volume only the briefest explanation of details has been possible. It is thus not capable of supplanting the text-book. But while the text-book must be left at home, the synopsis is sufficiently portable to be carried to the bedside. Under its guidance ward work may be made more systematic and the habit of correlating case observation and reading may be established. References can be made in the margins to the student's own cases. Thus annotated, the volume can form a valuable companion to the text-book in home reading.

The author himself discourages any tendency to use his volume as a text-book, stating that any such attempt must inevitably lead to failure. But he hopes that the book may serve for purposes of rapid revision. For example, "the worried student whose final examinations are within sight," is mentioned. An eleventh hour use of the book may lead to disaster. To be of use in revision, it should have been systematically used as indicated above during

the period of clinical clerkship. To turn at the last to a new volume where thousands of facts are marshalled in close array may cause panic or at least mental indigestion. The book, moreover, is too good to be used only in a hurry. The author is so concise, so sparing of words that deliberation and thought are demanded from the reader if the full weight and value of each point are to be attained.

The general arrangement of the work is based on that of Osler's "Principles and Practice of Medicine." The edition now under notice differs little from the first. The section on *encephalitis lethargica* has been re-written in much detail. The work is well printed, many distinctive types being used to give clearness in headings and sub-headings. The index is excellent and the binding serviceable. With due caution as to proper mode of using, the book may be warmly commended.

#### MALARIA IN THE MALAY STATES.

DR. MALCOLM WATSON'S exhaustive account of the campaign for "The Prevention of Malaria in the Federated Malay States" is a very welcome addition to the literature on this subject.<sup>1</sup> This is one of the books that instantaneously establishes a claim for a position on the bookshelves of everyone interested in preventive medicine. Dr. Watson describes with careful attention to every detail how, with limited funds, but with marvellous patience and perseverance, he and his fellow-workers have gradually eradicated malaria from one part after another of a country in which this disease has in the past been a veritable scourge. Certainly those who are concerned with similar problems in Australia and our mandated islands, should take heart when they read of what has been done in the Malay States; take heart and take hints!

But it is not the hygienic specialist alone who will find interest in the book. We commend it cordially to the notice of any of our readers who would like to obtain a more intimate knowledge of conditions in this generally little known part of the world. They cannot fail to be stimulated by the wonderful work and self-sacrifice of their medical colleagues and we venture to think that in future the mention of the Malay States will call up a mental picture of this devoted band rather than of rubber planters and finders of tin mines as heretofore.

#### PERISTALSIS.

"THE MECHANICS OF THE DIGESTIVE TRACT," by Dr. Walter C. Alvarez, is based on a lecture on peristalsis in health and disease delivered by the author before the American Roentgen Ray Society in 1920.<sup>2</sup> As its author indicates, the book deals only with the motility of the gastro-intestine and as such presents some very interesting features not generally known. In the early chapters he insists on the autonomy of the gastro-intestine—that it carries within itself the mechanism essential to peristalsis.

He then turns to the myogenic nature of the rhythmic contractions and the functions of Auerbach's plexus. The illustrated simile of the "gradient" idea is quaint, but useful. In a subsequent chapter this idea is practically applied, but the author wisely emphasizes the fact that much of this is purely suggestive, that it has weak points and that much work is still to be done.

The book can be recommended to physicians, surgeons and radiologists or those desiring further knowledge. For the worker in research on this subject a very complete list of references is provided.

<sup>1</sup> "A Synopsis of Medicine," by Henry Letheby Tidy, M.A., M.D., B.Ch. (Oxon.), F.R.C.P. (Lond.); Second Edition, Revised, 1922. Bristol: John Wright & Sons, Limited; Crown 8vo., pp. 915, with index. Price: 21s. net.

<sup>1</sup> "The Prevention of Malaria in the Federated Malay States: A Record of Twenty Years' Progress," by Malcolm Watson, M.D., C.M., D.P.H., with contributions by P. S. Hunter, M.A., M.B., D.P.H., and A. R. Wellington, M.R.C.S., L.R.C.P., D.P.H., D.T.M. & H., and a preface by Sir Ronald Ross, K.C.B., K.C.M.G., F.R.C.S., D.P.H., M.D., LL.D., D.Sc., F.R.S., Nobel Laureate; Second Edition, Revised and Enlarged; 1921. London: John Murray; Sydney: Angus & Robertson, Limited; Demy 8vo., pp. 381, with 115 illustrations. Price: 42s. net.

<sup>2</sup> "The Mechanics of the Digestive Tract," by Walter C. Alvarez, M.D.; 1922. New York: Paul B. Hoeber; Demy 8vo., pp. 192, with 22 illustrations. Price: \$3.50 net.



## The Medical Journal of Australia

SATURDAY, JULY 22, 1922.

### An Anthropological Problem.

IN introducing a discussion on the medical and hygienic aspects of dentistry, Dr. W. Stanley Wilkinson wisely reviewed the complex anatomical and physiological peculiarities of the mandible and its dental appendages and sketched the methods adopted for the redressement of defects of occlusion. His contribution will be welcomed as a learned and a practical exposition of a subject to which the medical profession usually pays but little attention. The subject tends, perhaps, to wear a new garb in view of the modern terms that have been introduced in addition to the modern methods which have emanated to a large extent from the other side of the Pacific Ocean. If medical practitioners wish to deserve the reputation of being masters of the sciences of the human body, it is necessary that they should not only consider the principles underlying the disturbances of mastication, but they should also turn their attention to the evolutionary aspect of the human race and the causes of those changes which have lent to the modern man his external characters and qualities. It happens that Professor Sir Arthur Keith has recently dealt with this subject in his Herter Lectures which he delivered before the alumni and the students of the Johns Hopkins University. It will be within the recollection of the majority of our readers that in the year 1860 Schaafhausen handed to Huxley a cast of the celebrated Neanderthal skull. Huxley studied this skull with extreme care and arrived at the conclusion that it was a specimen of the most ape-like, the most primitive and the most ancient type of humanity. Later Barnard Davis contradicted Huxley and produced as the justification of his criticism a modern skull carrying a remarkable resemblance to the Neanderthal type of skull. Professor Keith has taken upon himself the thankless task of being a self-elected arbiter between these two opinions.

It will further be remembered that in 1911 violent attacks were delivered against the attitude adopted by Professor Keith. Notwithstanding the fact that Professor Keith adduced much direct evidence of an unassailable nature, his opponents refused to accept his views, probably because their vision was less acute and their understanding less clear than those of the savant Conservator of the Museum of the Royal College of Surgeons. Professor Keith proved that the modern skull described by Barnard Davis was characteristic of acromegaly. The pituitary fossa was double the average size; the qualities of the acromegalic skull were present and the resemblance to the Neanderthal skull lay in these acromegalic qualities.

Professor Sir Arthur Keith naturally wondered whether the pituitary gland could be concerned with the evolution of man. He now brings forward fresh and even more convincing evidence in support of this contention that there is a strange similarity between the processes of growth which differentiate the primitive man from the modern man and the processes of growth which distinguish the acromegalic from the normal man. In acromegaly the four functions of the skull are profoundly affected. The cranial capacity is increased, so that its contents can expand without difficulty. As a carrier of the organs of special sense the acromegalic skull differs from the normal in that the nose and particularly its skeletal basis are more massive. The masticatory apparatus is fundamentally altered. The bones concerned with the origin of the temporal muscle are extended in a forward direction, the supra-orbital ridges are heaped up and the frontal air sinuses are enlarged. The zygomatic arch is strengthened and lowered, the ascending ramus of the mandible is elongated and often expanded and the alveolar margins are changed in shape and size. The fourth function of the skull, namely, that of serving as a complex mobile lever on which the muscles of the neck can act, is also disturbed. Professor Sir Arthur Keith describes this change aptly by the words: "The nuchal platform has its area greatly enlarged." It will be noted that the distribution of the bony and other changes in acromegaly result from an exaggerated growth under what may be termed physiological

control. The pituitary gland controls function rather than structure and excessive growth takes place, not equally in all tissues, but in those structures which are subjected to stimulation by use. In acromegaly the whole body is involved. The hands and the feet are affected first and most profoundly. The hands and the feet are usually stimulated more energetically and more effectually than by any other part of the body.

There is no longer any doubt concerning the part played by the pituitary gland and its special hormones in the production of acromegaly. These hormones obviously control growth under the influence of physiological use. The growth is abnormal, disturbed; and consequently the result of this disordered growth is detrimental to the victim. In the ape the same types of growth are seen, but the growth is entirely subservient to the uses of the animal. The large hands and feet, the immensely powerful limbs, the massive prognathic face and the broad nuchal platform are needed for the vicissitudes and dangers encompassing the lives of these wild creatures. From the anthropological studies of the primitive man, the same must have applied to them. Professor Sir Arthur Keith refers to the work of Schwalbe and Ardloff in demonstrating that in prehistoric times there were separate species and separate genera of humanity, just as there are to-day special species and special genera of apes. The masticatory arrangements of the gorilla may be studied with interest and advantage in relation to the problem of mal-occlusion of the teeth in the human being of to-day. Similarly there is much to be learned from a comparison between the jaw formation and jaw function in the gorilla and in the chimpanzee. Professor Sir Arthur Keith teaches that the differences between the jaw and neck of the Neanderthal man and those of modern man correspond to the differences in these structures of the gorilla and the chimpanzee. He has been able to direct attention to many signs and facts of immense importance in regard to the evolutionary changes which have yielded to the various races of mankind to-day their peculiar characters. More has still to be discovered. The whole study is intimately governed by a fuller understanding of the manner in which the pituitary hormones govern normal

growth. These lines of investigation are more fruitful than the empirical and often misleading observations of the results of artificial introduction into the human body of extracts of these powerful glands.

#### FEDERAL INCOME TAX RETURNS.

IN this issue we publish a special article, written by experts, on the correct methods of compiling the necessary returns of income for the purposes of the Federal income tax. As the returns have to be made by medical practitioners in private practice on or before August 31, 1922, this clear and exhaustive statement should be of use to our readers. Medical practitioners who hold positions remunerated by salary, have to make their returns by July 31, 1922. The need for guidance is felt by the majority of doctors in the Commonwealth. It is a frequent complaint of medical practitioners that deductions claimed have been disallowed. At times the deductions are passed in one year and questioned in the next. The Commissioner or Deputy-Commissioner has no power either to sanction a deduction or to refuse a claim that is good, since these matters are fixed by statute or by regulation. Moreover, in those instances in which there appears to be some ambiguity in the law or in the regulations under the *Federal Income Tax Assessment Act*, the past decisions of the Commissioner have created a precedent which can only be varied by a decision of the court.

We have recently received an inquiry concerning the validity of a deduction claimed in respect of *The British Medical Journal* and *THE MEDICAL JOURNAL OF AUSTRALIA*. It will be noted from the information given to the Federal Committee by the Commissioner that the amount of subscription to medical journals may be deducted to an extent not exceeding ten pounds sterling in any one year. No subscription is paid by members of the British Medical Association in Australia to either of the journals named. These journals are supplied as part of the privileges of membership of the Association. Consequently, a claim made for the deduction of a definite portion of the subscription paid to the

Branches of the British Medical Association as earmarked for the two medical journals would not be allowed. It may transpire that other points may arise on which our readers desire further information. Letters addressed to the Editor will be referred to experts on these matters and the replies will be published as promptly as circumstances will permit.

The question of the returns of income required by the State Income Tax Commissioners has not been overlooked. Hitherto no demand has made itself felt of assistance in this regard. Should members of the several Branches of the British Medical Association desire guidance in the preparation of these returns, an attempt will be made to have statements drawn up to meet their requirements. It will be recognized that the task of compiling six distinct statements would be costly. Their publication would occupy a considerable amount of space. It should further be remembered that the information concerning the income tax returns applying to one State would be of no interest to members residing in the five other States.

#### THE MECHANISM OF ANIMAL OXIDATION.

It is usually regarded that oxidation is the characteristic chemical reaction observed in the living tissues. Living cells take into themselves the substances liberated during the digestion and absorption of the food-stuffs, together with a supply of oxygen. Within the tissues a reaction occurs between these nutritive substances and this molecular oxygen, whereas no interaction takes place under similar conditions of temperature and pressure outside the living organism. The study of the circumstances under which are brought about these oxidations, yielding so much energy for the dynamic processes of animals and plants, is perhaps the chief problem of bio-chemistry.

In his Herter Lectures,<sup>1</sup> Professor F. Gowland Hopkins, F.R.S., has considered certain aspects of the mechanism of oxidation within the cell. He points out that much intellectual ingenuity has been expended in propounding theories dealing with the activation of molecular oxygen and the influence of special catalysts. While he admits that some theories may have stimulated experiment, he attacks vigorously some views which have been widely promulgated during the last half century and contends that these hypotheses inhibit productive thought and discourage experiment. He alludes to those con-

ceptions which assume oxidation as taking place in a particular kind of large chemical molecule within the cell. During the phase of construction or reconstruction both the oxygen and the materials to be oxidized are supposed to be built into the structure of this unstable molecule. At other times, and especially as a result of excitation, this molecule is held to break down, sometimes almost explosively, to furnish the energy of oxidation and to yield the waste products of katabolism. Various forms of these views are expressed in the inogen hypothesis of Hermann, the side chain theory of Ehrlich and the biogen idea of Verworn. All these imply that those parts of a living cell which exhibit the attributes of life, are composed of molecules, each of which is to some extent a unit of living matter. They transfer to the chemical unit the properties of living protoplasm. While such theories remain vague, they offer no aid to accurate explanation; when details are given they suppose qualities in the living molecule which do not belong to it if it is considered as a system of atoms or atomic groups associated by valency.

As an alternative Professor Hopkins affirms that all the experimental facts support the view that the living cell or its equivalent structure is itself the unit. Its manifestations of life depend on changes undergone by diverse molecules present in the cell in the colloidal state. Such molecules, similar to those found in the inanimate world, take part in chemical reactions which may be studied by the usual methods of chemical dynamics. Accordingly the essence of what is peculiar to the cell as a chemical system lies not in the nature of the chemical processes, but in their arrangement and sequence.

In support of this contention Professor Hopkins reviews the data, largely obtained by the admirable researches of the School of Physiology at Cambridge, which prove that oxygen is not "assimilated" before it exerts its functions within the cell. This evidence, which need not be given in detail, is concerned with the utilization of oxygen by muscle. No tissue makes more demand on the supply of oxygen than working muscle. It can be shown that the oxygen taken up by a muscle is used at the time to burn up substances set free during the muscular contraction. At no time is there any oxygen stored in complex molecules to provide oxidation energy during the decomposition of the molecules. The oxygen serves for the combustion of a certain proportion of the lactic acid produced from a carbohydrate, probably hexose phosphate, during muscular activity. The intake of oxygen by the muscle is strictly proportional to the amount of lactic acid converted to water and carbon dioxide during the same period of time.

Certain substances are capable of spontaneous oxidation when in contact with molecular oxygen at ordinary temperatures. When such oxidation occurs, it is usually observed that oxygen is taken up, not atom by atom, but as a molecule still partly intact, so that a substance of the peroxide type results. Such a peroxide may act catalytically on substances not capable of autoxidation by molecular oxygen, constituting what is called oxygenase.

<sup>1</sup> Bulletin of the Johns Hopkins Hospital, October, 1921.



Such oxidations are associated with a reduction. The agent which brings about oxidation is itself reduced. Sometimes the reduction seems to be the essence of the phenomenon, as when hydrogen is transferred from one substance to another, the latter being thus reduced. The name, oxygen acceptor, is given to a substance that takes up oxygen from peroxides and the name, hydrogen acceptor, to the substance reduced by the addition of hydrogen.

Recently Professor Gowland Hopkins has isolated from yeast, striated muscle and mammalian liver a dipeptide of cystein and glutamic acid,  $\text{HS} \cdot \text{CH}_2 \cdot \text{CH} \cdot \text{NH}_2 \cdot \text{CO} \text{---} \text{NH} \cdot \text{CH}(\text{COOH}) \cdot \text{CH}_2 \cdot \text{CH}_2 \cdot \text{COOH}$ . This dipeptide yields a colour test with sodium nitro-prusside. Since all tissues exhibit this colour reaction, the dipeptide is probably of wide spread distribution in living cells. This body is oxidizable at ordinary temperatures,  $2\text{R} \cdot \text{SH} + \text{O} = \text{R} \cdot \text{S} \text{---} \text{S} \cdot \text{R} + \text{H}_2\text{O}$ . This reaction can be reversed readily. If fresh tissues are placed in a dilute solution of the dipeptide in the disulphide form, in a few hours the dipeptide is reduced to the sulphhydryl form.

Some observations show that these reactions both occur in living cells and that they play a real part in the dynamics of the cell. The hydrogen ion concentration within the cell determines the direction of the reaction. In faintly acid solution,  $\text{pH} = 6.8$ , the dipeptide serves as a hydrogen acceptor taking up hydrogen from substances in the tissues capable of oxidation. In neutral solution,  $\text{pH} = 7.4$ , the dipeptide serves as an hydrogen "donator" freely giving up hydrogen. Under these conditions it accelerates the reduction of methylene blue by the tissues. Oxidation and reduction are thus strictly reversible changes in the tissues,  $\text{---SH} \cdot \text{HS} \text{---} \rightleftharpoons \text{---S} \text{---} \text{S} \text{---} + \text{H}_2$ . It would thus appear that the activation and transport of hydrogen represent aspects of the chemical dynamics of the cell.

#### DYSMENORRHOEA AS AN INDUSTRIAL PROBLEM.

MENSTRUATION is to some women an affair of no moment, something that they regard as little more than an inconvenience. The majority, however, are less fortunate and with them the menstrual period is a condition of more or less discomfort or it may be accompanied by pain of varying severity. It may be difficult to determine at what point the disagreeable accompaniments to menstruation cease to be physiological and enter the realm of the pathological. The susceptibility of women to pain and their ability to bear discomfort is so variable that obviously no hard-and-fast rule can be laid down. While dysmenorrhœa may be held to be present when menstrual pain is so severe that it interferes with the occupation of the sufferer, this definition is not always a reliable one. It may be taken for granted that women who have to earn their living, will not usually give in before they are compelled and that few of the leisured class will forego their social pleasure without urgent cause. At the same

time, many women manage to "carry on" under great inconvenience and acute discomfort when much could be done to give them relief. The rate at which modern civilization compels people to live is different to what it was two or three generations ago. The commercial and industrial world has been invaded by women to a very large extent and the bearing of dysmenorrhœa on commercial life and industry is a matter that is demanding consideration by the medical profession.

The subject has recently been broached by Dr. Samuel R. Meaker.<sup>1</sup> Dr. Meaker defines dysmenorrhœa in this connexion as any catamenial disability which lessens the efficiency of an employee and points out that industrial crippling from dysmenorrhœa may occur in three ways. In the first place, a girl may do her work, but with lessened efficiency. She may begin her work, but be compelled to report during the day to the hospital or rest room. Thirdly, she may stay at home for a full day or longer. Dr. Meaker was unable to obtain statistics of those in his first group, but has gathered figures of the number of girls reporting to the rest room or hospital at four industrial establishments—a factory, two large stores and a telephone exchange. The figures extend over periods up to two years. Of 7,876 girls in these establishments, slightly over 10% sought relief during each month. In one establishment at which 1,750 girls are employed, ninety-six reported three or more times during eleven months and it was estimated that in this establishment more than three-fifths of the members of the female staff had occasion during the year to seek advice on account of menstrual troubles. This was in an establishment at which the practice obtained of inquiring into the presence or absence of dysmenorrhœa when an employee is engaged and of rejecting those who admitted regular incapacity. One-eleventh of the number of the girls reporting were sent home for the rest of the day. It was estimated that the industrial loss exceeded 1% of the total time of girl employees who stayed at home for the whole day. The treatment, as Dr. Meaker points out, is easily arranged in industrial establishments with a well-organized medical service. Pelvic examinations are seldom necessary, at any rate in the case of single girls; rest with hot drinks and suitable drugs are mainly used. Tact is very necessary on the part of the nurse in charge, as well as that of physician attached to the establishment.

It must be remembered in all medical prophylaxis or treatment undertaken in connexion with any industry that the attitude of the employer is a most important factor. He must be made to realize that industrial medicine can lessen inefficiency and loss and make for contentment among employees. At the same time, any treatment for dysmenorrhœa would have to be part of a scheme of general medical attendance and supervision. Undue emphasis laid on such a subject might only encourage neurosis, where a healthy mental attitude is of supreme importance.

<sup>1</sup> The Journal of Industrial Hygiene, June, 1922.



## Special Article.

### FEDERAL INCOME TAX.

BY H. L. CUNNINGHAM, F.C.P.A.,  
AND

ROBT. J. STIFFE, A.C.P.A.,  
Sydney.

WE understand that on occasions THE MEDICAL JOURNAL OF AUSTRALIA has been approached by medical men for advice on certain points concerning their income returns. We have, therefore, written the following article, which we believe will assist the medical profession generally in preparing the same to June 30, 1922.

Many doctors have their books kept on a proper double entry system; to those there will be no great difficulty in preparing their returns; but to those who have not done so and are not well versed in the necessary accountancy knowledge required for the preparation of the return, we specially direct our remarks.

#### FORMS TO BE USED.

A doctor practising his profession on his own behalf will prepare a return of his income on a form supplied by the Department described as "First Form (A)."

When two or more doctors are practising in partnership, a return will be prepared for the whole of the partnership transactions on "First Form (A)."

The net income shown on the partnership return is not taxable by the Department against the partnership, but each individual partner is taxable on his share. Details as to the names, place of residence, proportionate share of income to which each partner is entitled and amount of each share must be given on Statement No. 5 of the return.

Each individual partner will then prepare a return on form marked "First Form (B)," showing the amount of his share as shown on Statement No. 5 of the partnership return, together with all his income received from other sources in Australia, except interest on Commonwealth 4½% War Loans and State Government Loans.

#### "First Form (A)."

This form is divided into four parts, Part "A," Part "B," Part "C" and Part "D."

#### Preparation of Return.

We shall first deal with Part "C," as this part will be used by doctors practising individually or as a partnership as far as their professional transactions are concerned.

**Item No. 37.—Income.**—The amount of gross income from the doctor's profession, by way of fees, lodge dues and medicine supplied will be shown opposite this item.

If he has kept a proper record of all fees earned during the twelve months, he will readily arrive at the figure. If such is not the case, we can only suggest either of the following:

(a) If he is in the habit of banking all fees, etc., received, his gross income will be stated as the total amount of fees banked during the year, as shown in his pass book.

(b) If he does not bank all moneys received, then the total amount of fees, etc., actually banked, to which must be added all fees not banked, e.g., those retained and used by him for expenses, either private or professional.

When the course described in (b) is being followed, we suggest that a book be kept, recording in detail a list of the expenses so paid, as it is quite probable that part of them, if not the whole, would be in connexion with the profession and could be claimed as deductions from his income.

**Items No. 38 to No. 42.**—These items will only be used by a doctor who conducts a dispensary to supply his patients with medicine.

If such dispensary is entirely separate from the medical practice and separate charges have been made to patients for medicine as distinct from professional fees and complete records kept, the total sales will be stated opposite Item No. 38 instead of being included in Item No. 37.

**Items No. 39 to No. 42.**—These are all self-explanatory on the return and the amounts referring to each item should be filled in where a doctor keeps a supply of medicines on hand for the purpose of sales to his patients.

It will be noted that the term "Stock and Materials on hand" means stock of chemicals, etc., and does not include furniture or surgical instruments.

**Item No. 43.—Bad Debts Recovered, etc.**—This item will only affect doctors as far as any bad debts recovered are concerned, the total of which should be shown here.

Only those items which have been actually written off as bad and claimed as a deduction from income in previous years and which have been recovered during the year ended June 30, 1922, should be shown here. Care should be taken by doctors who do not keep a complete set of books, to see that such items are not also included in the gross income under Item No. 37; otherwise double taxation will result.

**Item No. 44.**—This item will not apply to a doctor, as all income will be shown under Item No. 37.

**Item No. 45.—Rent.**—Where a doctor pays rent for the premises in which he is carrying on his practice and any part of such rented premises is used as a residence, the whole amount paid as rent is deductible under Item No. 58, but an amount equal to two-thirds of the total rent paid should be shown opposite this item (No. 45) as income. This course is equivalent to deducting only one-third of the rent paid and not including any part of the rent as income. (A Departmental Regulation provides that if the proportion of rent included as income is considered too high, the amount considered to be a fair proportion should be stated and the grounds on which this amount is estimated should be given.)

#### Deductions.

The following items of expenditure may be claimed as a deduction from the gross income, but it is necessary in certain instances that schedules giving the necessary details of certain expenses must accompany the return, otherwise the Department may disallow the same, either wholly or in part. The amount actually paid away during the year ended June 30, 1922, should be shown to the near-

est pound sterling (e.g., £20 9s. would be shown as £20, while £20 11s. would be entered as £21) opposite the respective items in column headed "Deductions."

**Item No. 56.—Salaries and Wages.**—The amount of salaries and wages actually paid to any person in the doctor's employ, who is engaged in work necessary for the production of his income, e.g.:

- (a) Assistant (on a salary).
- (b) Nurse.
- (c) *Locum tenens*.
- (d) Charwoman for cleaning consulting rooms. (If rooms are cleaned by a general servant, portion of her wages can be claimed as a deduction under this head.)
- (f) Chauffeur.
- (g) Groom.

If any salary or wages are paid to any one person at a rate exceeding £100 *per annum*, a list thereof must be supplied on Statement No. 4 of the return giving the details set out therein.

**Item No. 57.—Food for Employees.**—The actual amount expended in feeding employees may be deducted or if exact information is not available, an amount at the rate of £1 per week for each employee supplied with food.

**Item No. 58.—Rent.**—The amount of rent paid for consulting rooms, or if a doctor is practising at his place of residence rented by him, then the total amount of rent paid for such residence, should be shown here. It will, therefore, be noted that a doctor renting a residence and using a portion of it for consulting rooms is allowed one-third as a deduction, this third being arrived at by entering the total amount of rent paid for the residence under Item No. 58 and by entering two-thirds of it under Item No. 45.

Should a doctor be practising and living in his own property, he must return a proportionate amount of its value as income, to which we will refer more fully later under the heading of "Income from Property."

**Item No. 59.—Rates and Taxes.**—Should a doctor be renting or leasing property which he is using as a residence and consulting rooms combined and the lease provides for the payment by the tenant or lessee of municipal and water rates, one-third of such rates (not including excess meter rate) actually paid during the year can be claimed as a deduction under this item and the remaining two-thirds in Part "B" from property income. If there is no income from property, the whole amount is deductible in Item No. 59. If the premises are wholly used as consulting rooms only, the whole of such rates can be claimed. State income tax paid during the year on income from personal exertion is also a deduction under this heading.

It will be necessary to furnish a detailed list of the above rates and taxes with the return.

**Item No. 60.—Insurance.**—Any fire or burglary insurance premiums paid by a doctor for the insurance on any property used in conducting his practice, such as consulting, office and waiting room, furniture, surgical instruments and plant, motor-car, horses, vehicles, together with workmen's compensation premiums, are deductible.

**Item No. 61.—Interest.**—The actual amount of interest paid on money borrowed for the purpose of acquiring or carrying on a practice may be claimed as a deduction under this heading. Details as to whom the interest was paid, must be supplied.

Interest paid on a mortgage of land and residence being purchased on terms will be dealt with later under the heading "Income from Property" and must not be shown under this heading.

**Item No. 62.—Depreciation.**—A deduction may be claimed under this heading for the wear and tear of property (other than land and buildings) used for the purpose of carrying on the practice, as follows:

- (a) Doctors' instruments. All replacements of these are deductible, but no depreciation on them may be claimed.
- (b) 5% of cost of electro-cardiograph.
- (c) 2½% of cost of furniture and fittings (consulting rooms).
- (d) 7½% of cost of furniture and fittings (hospitals).
- (e) 20% of cost of carpets.
- (f) 10% of cost of ophthalmic surgeon's machinery.
- (g) 10% of cost of motor-car, motor-bicycle or ordinary bicycle.
- (h) 7½% of cost of Röntgen ray (X-ray) apparatus.
- (i) 10% of cost of type-writer.
- (j) 7½% of cost of high frequency current plant.
- (k) 10% of cost of buggies and sulkeys.
- (l) 10% of cost of horse.
- (m) 20% of cost of horse-rugs.
- (n) 10% of cost of harness.

It will be noted that depreciation can only be claimed as a deduction at the above rate, calculated on the diminishing value of the assets as at June 30 of the previous year, i.e., the cost price of the asset, less the above percentages of depreciation deducted for each year of use in the business. For example, on a motor-car costing £400, the first deduction would be 10% of £400 = £40; the second deduction would be 10% of £360 and so on. No depreciation is allowed on any of the above purchased during the year on which the income return is based.

For the year ended June 30, 1922, a detailed list of such diminished values at June 30, 1921, the percentage and amount claimed as depreciation of each asset, must accompany the return.

**Item No. 63.—Repairs.**—All repairs (which would not come under the heading of "Alterations, Additions or Improvements") effected by the practitioner at his own cost to any assets employed in carrying on the practice, including repairs to that part of rented premises used as consulting rooms, may be claimed here as a deduction. A list showing the nature and cost of all repairs must be given with the return.

**Item No. 64.—Bad Debts.**—If, as mentioned previously, all fees earned have been returned as income, irrespective of whether they have been collected or not, and any of such fees still remain uncollected and are irrecoverable and written off as bad debts, such amount may be shown here and will be allowed

as a deduction, provided a list giving the following particulars accompanies the return:

- (a) Name of patient.
- (b) Date when incurred (any debt incurred prior to July 1, 1914, is not deductible).
- (c) Date when written off.
- (d) Amount written off.
- (e) The proof that the debt is bad.
- (f) The nature of the transaction, e.g., patient's fees, investment losses, etc..
- (g) The year in which the amount of the bad debt was included as income in the income tax returns.

If the practitioner has included as income only the actual fees paid to him, he is not entitled to any deduction for bad debts.

It should be noted that if a taxpayer makes a claim for the deduction of bad debts (which have not been proved to be bad), he renders himself liable to the penalties prescribed by Section 59 of the *Income Tax Assessment Act* and it is immaterial whether the debt has been written off or not.

*Item No. 65.—Exchange, Commission and Discount.*—This heading will hardly be affected by any transactions of a doctor, except in so far as any exchange paid on country cheques is concerned. The exchange actually paid should be stated here.

*Item No. 66.—Travelling Expenses.*—Only travelling expenses incurred in connexion with the practice in the production of income will be allowed as a deduction, e.g.:

- (a) Motor-Car Expenses: Cost of running, benzine, oil, tyres, garaging, etc.. (Repairs will be shown under separate heading, Item No. 63.)
- (b) Buggy and Sulky Expenses: Horse feed, shoeing, etc.. (Harness and vehicle repairs will be shown under separate heading, Item No. 63.)
- (c) Railway, tram, boat, taxi-cab and cab fares or the cost of hiring any vehicle for conveyance to and returning from a professional visit.

*Item No. 67.—Contribution to Provident Fund.*—Any contributions paid by a doctor to an employee's benefit or provident fund may be claimed as a deduction here; a detailed list must be supplied.

*Item No. 68.—Gifts.*—The wording on the return is self-explanatory. It will be noted that either receipts or cheque butts in support of the claim must be submitted to the Department, otherwise the deduction will not be allowed.

*Item No. 69.—Stamps, Stationery and Telegrams.*—The cost of all stamps, stationery, telegrams or printed matter used in connexion with a doctor's practice will be allowed as a deduction under this heading.

*Item No. 70.—Gas, Electric Light and Telephone.*—A proportion of the cost of gas or electricity or other means of lighting as would refer to that used in connexion with a doctor's practice may be claimed under this head, together with the amount paid for telephone during the year.

*Item No. 71.—Other Business Expenses.*—Any other expenses, not elsewhere included, necessarily

incurred in the production of professional income, may be shown under this head. A detailed list of the expenses must accompany the return, e.g.:

- (a) Cost of bandages (where no dispensary is kept).
- (b) Cost of chemicals (where no dispensary is kept).
- (c) Accountancy fees, etc., etc..
- (d) Subscriptions to medical journals.

We notice in the issue of *THE MEDICAL JOURNAL OF AUSTRALIA* of March 4, 1922, that the Federal Committee has received correspondence from the Federal Commissioner of Taxation dealing with the cost of medical journals and that the Commissioner had decided to allow claims up to a maximum of £10 *per annum* in this connexion as a deduction from income, but the amount expended in each case should be stated by the taxpayer.

In the above remarks we have referred to each item only as it applies directly to the transactions of a medical practitioner in carrying on his professional practice. With regard to the remaining items, No. 72 and No. 76, although they may not necessarily affect the return in so far as professional transactions are concerned, it should be specially noted that the following deductions can be claimed:

*Item No. 72.—Calls on Shares.*—The total amount of calls paid in the year covered by the return to Australian mining companies and syndicates, also 5% of calls paid to other Australian companies. A list must be attached to the return. Allotment and application moneys paid in respect of shares in companies are not calls and no part of them is deductible.

*Item No. 73.—Life Assurance Premiums.*—Premiums paid by a doctor in Australia on the insurance of his own life or that of his wife or children are deductible. The maximum amount allowed is £50.

*Item No. 74.—Deductions for Children.*—The sum of £30 for each child under sixteen years of age at July 1, 1921, wholly maintained by the person making the return, or a proportionate amount in respect of a child born between July 1, 1921, and June 30, 1922.

Details under the respective headings must be supplied on Statement No. 6 on the return.

*Items No. 75 and No. 76.*—These items will hardly apply to any of the transactions of a doctor, but should either of them do so in any rare instance, the wording on the return is self-explanatory.

Items No. 37 to No. 45 will now be added up, thus showing the "total income."

Items No. 56 to No. 76 added together will represent the "total deductions" from income.

By deducting the total deductions from the total income the net taxable income from a doctor's profession is arrived at.

We will now turn to Part "A" of the return. This part is used only in connexion with any income received by a doctor other than that from his profession or:

- (a) By a doctor who is working on a salary for another doctor or for any other person or company and
- (b) By a doctor who is working in partnership



with another doctor, as already mentioned under the heading of "Forms to be Used."

For (a) and (b) "First Form (B)" should be used.

#### Income from Personal Exertion.

When a doctor is working on a salary, he will show the total amount of salary actually received during the year opposite Item No. 1, the value of quarters, board and travelling allowances (if any) opposite Item No. 2 and the rental value of premises provided by the employer and used for the purpose of residence (if any) opposite Item No. 3.

Item No. 4 will be used by any individual partner in a partnership to show the total amount of his share as stated, in Statement No. 5 of the "Partnership Return."

Opposite Item No. 5 will be shown any income received as a beneficiary under a will, etc., if the trust income is from personal exertion; if the trust income is from property it will be shown under Item No. 20, Part "B."

Items No. 6 to No. 9 are hardly likely to affect any doctors, but are all self-explanatory.

#### Deductions.

Opposite Item No. 10 will be shown the amount of interest (if any) paid by a doctor (not by the partnership) on money borrowed by him to acquire an interest in a partnership practice; full details of such interest should be given.

The deductions under Items No. 11 to No. 14 will only be shown on this part of the return if they are applicable to any of the transactions of a doctor working on a salary or in partnership. A doctor practising his profession in his own interest will claim such deductions (if any) under similar headings in Part "C."

*Item No. 15.—State Income Tax.*—The amount paid for State income tax on personal exertion income is to be shown opposite this item by doctors working on a salary or in partnership.

Finally, we will deal briefly with "Income from Property," Part "B" of the return.

#### Income from Property.

*Item No. 16.—Rent Received.*—The total gross rents received by a doctor from any property owned by him will be shown opposite this item. A detailed list of the tenants and amount received from each should be attached to the return.

*Item No. 17.—Share in Partnership.*—This heading will not generally be used by a doctor, as any income received as a partner in a medical practice is classed as income from personal exertion and will be stated under Item No. 4, Part "A," referred to above. The item would only be used in the case of a share in the investments of a partnership.

*Item No. 18.—Dividends and Interests.*—The totals of all dividends received from any company and interest received from any individual investments should be shown under this heading, with the exception of interest from:

(a) Bonds, stocks or debentures issued by a State Government or a State savings bank and

(b) Commonwealth 4½% War Loans, which are not taxable.

Full details of the dividends and interest received

must be supplied in Statements No. 8 and No. 9 respectively.

*Item No. 19.—Annuities, etc.*—Any annuities received will be shown under this heading.

*Item No. 20.—Income Under a Will.*—Where income received as a beneficiary under a will or other trust instrument is income from property, such amount received will be shown here.

It should be noted that a legacy or bequest from a deceased person's estate is not taxable as income.

*Item No. 21.—Capital Value of Own Residential Property.*—If a doctor is using his own land and house for residential and consulting rooms combined, he must ascertain the capital value of the portion used as a residence and must return opposite this item as income 5% of such capital value. For example, the value of the property is, say, £2,400. If he is satisfied that he uses one-third of his property for professional purposes, he will show the value of his residence as £1,600 and will, therefore, enter opposite this item as income 5% of this amount, viz., £80.

*Item No. 22.*—This item will hardly apply to the transactions of a doctor, except perhaps where a profit has been made on the assignment of an unexpired lease of a suite of consulting rooms.

#### Deductions.

Items No. 23 to No. 26 will be used by a doctor working on a salary or one working in a partnership. A doctor practising on his own account will claim such deductions under similar headings in Part "C," unless his income from property exceeds his income from personal exertion, in which case Items No. 23 to No. 26 will be used instead of Part "C."

*Item No. 27.—Rates and Taxes.*—All rates and taxes paid are deductible. Those not claimed in Part "C" should be shown here.

*Item No. 28.—State Income Tax.*—The portion of the amount of State income tax paid in regard to tax on income from property will be shown here.

*Items No. 29 to No. 34* are all self-explanatory and refer to repairs, insurance, interest, commission and rent paid on property from which income is received and that owned by the taxpayer and used as a residence. Such amounts paid will be allowed as a deduction, but details of the same must be supplied.

*Item No. 35.—Calls on Shares.*—This item is for a similar transaction as Item No. 72 of Part "C" previously referred to, but will be used in this part only by doctors practising in partnership or working on a salary.

*Item No. 36.*—Should there be any other class of expenditure, not elsewhere included, incurred in the production of income from property, such as accountancy fees, bank charges, etc., they may be claimed under this heading as a deduction. A detailed list must accompany the return.

*Part "D."*—Should income be earned in pastoral and agricultural industries, such as farming, grazing, dairying, vine growing or fruit growing, it should be returned in Part "D" of the return, "First Form (A)."

## EXPENSES NOT ALLOWED AS DEDUCTIONS.

The following expenses are not in any circumstances allowed as deductions:

- (a) Additions or alterations to trade or other income-earning premises.
- (b) Additions to plant and machinery (except in mining businesses under certain conditions).
- (c) Any domestic expenditure or the cost of living of members of taxpayer's family who are not exclusively engaged in the business or who are engaged in domestic duties.
- (d) Cost of sewerage connexions.
- (e) Cost of travelling between the taxpayer's private residence and place of business.
- (f) Depreciation of buildings, leaseholds or land and improvements (except of covenanted improvements on leasehold land in which improvements the lessee has no tenant rights) or any depreciation of a kind that may be made good by repairs.
- (g) Depreciation of goodwill.
- (h) Doubtful debts.
- (i) Expenditure incurred to protect income.
- (j) Federal income tax.
- (k) Insurance (fire or burglary) on household furniture or personal effects.
- (l) Interest not actually paid in year ended June 30, 1922.
- (m) Interest paid on money which is not used to produce income.
- (n) Losses by fire, accident, robbery or embezzlement.
- (o) Losses incurred in any previous year.
- (p) Losses not connected with or arising out of the taxpayer's trade or business.
- (q) Purchase money paid, except for trading stock.
- (r) Payments from husband to wife or from wife to husband, unless the Commissioner is satisfied that the payments have been made *bona fide* in the course of business and for services rendered.
- (s) Premiums on insurances effected outside Australia.
- (t) Rent of private residence.
- (u) Rent of trade premises not actually paid in year ended June 30, 1922.
- (v) Repayment of moneys borrowed, including amounts of principal included in annual payments on loans.
- (w) Wages not actually paid.
- (x) Wages to persons not employed in the trade or business.

## DETAILED LISTS OF DEDUCTIONS CLAIMED.

Wherever deductions are claimed on account of any item in respect of which the form calls for a detailed list, such list must be attached to the return. Compliance with this direction will save much correspondence and irritation to medical practitioners.

Separate lists are required of:

1. Charitable contributions. Verification thereof, such as receipt, cheque butts, etc., must also be attached.
2. Calls in companies.
3. Fire and burglary insurance premiums (see Item No. 60, page 102).

4. Children (to be shown in Statement No. 6 of return).

5. Rates and taxes.

6. Repairs.

7. Depreciations (items, values and rates of depreciation).

8. Bad debts (written off); dates incurred and amounts. "Date incurred" means:

- (a) In the case of a single transaction, the date of the last payment on account or, if there is no payment, the date of the transaction.
- (b) Where the balance due is the result of a series of transactions, as in (a), but may be extended to the date of the last purchase subsequent to the last payment on account.
- (c) Where the Commissioner is satisfied that by some catastrophe a debt previously good has been made bad since the date of the catastrophe.
- (d) In the case of dishonoured bills, the date when dishonoured.

9. Contributions to benefit funds.

10. Wages paid to employees. This list must be compiled in accordance with the heading set out in Statement No. 4 of the form of return and in particular must show wherever possible whether each employee is married or single.

11. Other business expenses.

A copy of the return, as well as all books, accounts, memoranda and all data from which the return is made up, should be preserved for future reference in the event of further information being required by the Commissioner or the Deputy Commissioner. The Department will only supply taxpayers with a copy of their returns upon payment of the prescribed fee. (The minimum fee is 2s. 6d. for each return.)

Returns for income derived wholly or partly from business and professions must be lodged on or before August 31, 1922. Returns for all other incomes must be lodged on or before July 31, 1922.

## GENERAL.

In conclusion, we might state that in the above remarks we have confined ourselves mainly to the general transactions of a medical practitioner in the ordinary course of his profession, supplemented by a few brief remarks regarding income from any investments in property, etc..

We have not gone into any of the fine points that may arise in rare instances where extraneous transactions have occurred (in which case a special inquiry at the Federal Department of Taxation regarding the same should be made). Apart from these, we believe that if a medical practitioner will follow out carefully all the above directions, he will avail himself of the full deductions from his income as allowed by the *Federal Income Tax Act*.

We have endeavoured to be as concise and explicit as possible and trust that the above, when read in conjunction with the return itself, will prove of some assistance to the medical practitioners in Australia in preparing their Federal income tax returns for the year ended June 30, 1922.

## Abstracts from Current Medical Literature.

### SURGERY.

#### Inguinal Herniæ.

R. HAMILTON RUSSELL (*The British Journal of Surgery*, April, 1922) writes of "Inguinal Herniæ: Their Varieties, Mode of Origin and Classification." First he deals with oblique inguinal hernia, pointing out that all varieties of such herniæ are due to developmental abnormalities of the scrotal peritoneum or *processus vaginalis*. The *processus* is composed of two parts, one in relation to the spermatic cord, named the "funicular" portion, and the other around the testis, called the "testicular" part. At about the time of birth in normal children the funicular part becomes obliterated from the immediate neighbourhood of the testis to the abdominal peritoneum. Partial or complete failure of the funicular process to close produces the different varieties of oblique inguinal hernia. In group "A" of Russell's classification of oblique hernia there are two subvarieties. In one there is total failure of closure and the hernia is free to pass to the testicular portion (total funicular hernia). In the other the communication between funicular and testicular parts is closed, but the funicular portion persists and the hernia can pass down the open tube, but not into the testicular part (partial funicular hernia). In group "B" the characteristic feature is an accidental adhesion of the funicular process to the developing abdominal wall. This may result in preventing the proper descent of the testicle or in the drawing out of a diverticulum of peritoneum from the funicular process. Such diverticulum, being attached to the abdominal wall, may accommodate a hernia which is interstitial or interparietal in type and this will be properitoneal, intermuscular or superficial inguinal according to the relation of the diverticulum to the abdominal muscular layers. If the portion of peritoneum which adheres to the abdominal wall belongs to the testicular part of the *processus vaginalis* a hernia of the variety described under group "C" is formed. The descent of the testicle is not prevented, but the anchored part of the testicular peritoneum draws the latter out into a long process parallel to and in front of the funicular process. If in such a case the funicular process closes completely at birth, the patient is left with a very much elongated *tunica vaginalis*, which may later form a large hydrocele. If there is total failure of closure a hernia developing later will have an enormous sac for its reception—*hernia magna*. It is the partial closure that produces the most interesting type of hernia. This will be a moderate oblique inguinal hernia, but the surgeon when operating will open first into that part of the testicular peritoneum which has been drawn out by its adhesion to the abdominal wall, he will find the testicle

in the bottom of this compartment, but it will not be in the hernial sac. To open this will need an incision through the posterior wall of the *tunica vaginalis*, where he will find the sac in relation to the cord. It can be seen that such a hernia may bulge into the posterior wall of the *tunica vaginalis*. This is the hernia called encysted or infantile. Lockwood's view was that the *processus vaginalis* was obliterated high up near the canal, but remained patent below this and the hernial sac was an abnormal and separate protrusion pulled down by over-action of the *gubernaculum testis*.

#### Hypertrophy of the Breast.

LINWOOD D. KEYSER (*Surgery, Gynecology and Obstetrics*, December, 1921) discusses the development and the physiology of the breast in connexion with massive hypertrophy of this gland. He summarizes the evidence by stating that the mammary gland is controlled by endocrine forces of which the ovaries and *corpora lutea* supply the chief. He considers that no evidence has been adduced that the uterus, decidua, fœtus or placenta has any direct bearing on the functions of the breast. The hypertrophy may reach an enormous size; one patient is said to have had breasts which weighed eighteen and twenty-seven kilograms. The disease may occur in virgins or married women, but the age of the majority of the patients is between sixteen and twenty years. Race and climate have no influence and heredity very little. The condition may be unilateral. There is no relation between the increase in size and secretory activity, for a very large breast may have no secretion. Pain may be present, apart from the discomfort due to the mass of the breast. In some cases menstruation seems to act as the stimulus to growth of the breast. The breast may enlarge at the first menstruation and continue to do so at each successive period. Some authors have noticed sex anomalies and pathological conditions of the reproductive organs in association with the hypertrophy. The classification usually adopted suggests the time of life at which the condition appears, such as infantile hypertrophy, diffuse virginal hypertrophy, gravidity hypertrophy, hypertrophy in parous women not associated with pregnancy. According to the pathological anatomy of the disease, it occurs in main groups: (i.) fibro-epithelial hypertrophy with occasional fibro-adenoma, (ii.) adipose hypertrophy, which is much rarer. The ætiology is obscure. Trauma has no relation to the disease. Though the hypertrophy may begin about puberty, it occurs at other periods of life so frequently that age is not an essential factor. The histological picture does not resemble a neoplasm. The author makes the vague suggestion of dyscrasia of the endocrine system in an endeavour to explain the ætiology. The diagnosis is usually easy. The diffuse nature of the process, the involvement of both breasts, the absence of any sign of tumour growth, the abnormal size of the

breasts, all point to diffuse hypertrophy. The treatment is unsatisfactory; the condition rarely regresses spontaneously. Drugs, such as iodides, local applications and pressure have no effect. Organo-therapy is useless. In the end amputation of the breasts has to be performed.

#### Gas Cysts of the Intestine.

JACOB LOUIS BUBIS AND CARL EMIL SWANBECH (*The Annals of Surgery*, May, 1922) discuss gas cysts of the intestine. The ætiology is obscure. One theory states that the condition results from putrefaction of certain cells, another that this gas is liberated from the tissue lymphatics. Neither has any convincing evidence in support of it, nor is there much to support the theory of bacterial origin or new growth. The writers favour the mechanical theory. Through some break in the surface of the mucosa, possibly so minute as to be overlooked, gas enters the tissues of the intestinal wall and spreads widely. It corresponds to surgical emphysema in other regions of the body. In their own case an ulcer was present at the base of the appendix and gas cysts were present in the caecum and ascending colon. The gas consists of carbon dioxide, oxygen, hydrogen and nitrogen. It may be inflammable. The cysts vary from a pin-point to the size of a fist. They are distributed through all the coats of the bowel, but especially through the mucous and submucous layers. The symptoms are obscure. In some a doughy, resonant tumour is present. The cysts have been known to disappear after a laparotomy. The authors resected the affected bowel in their case. If the infiltration of the bowel wall tends to cause obstruction, short circuiting or resection is demanded.

#### Hernia of the Bladder.

JAMES NORMENT BAKER (*The Annals of Surgery*, May, 1922) describes a case of hernia of the bladder. While operating for the relief of a strangulated inguinal hernia in a man, aged seventy-three, he opened the bladder. A pouch was found projecting from the bladder into the medial side of the hernial sac. Apart from the presence of such a pouch, the bladder in large inguinal herniæ is very close to the medial aspect of a hernial sac and can be included in the ligature put round the sac if the ligature is placed very high up. Hernia of the bladder appears usually after middle life. According to the relation of the bladder to the hernial sac, the condition may be described as extraperitoneal, paraperitoneal or intraperitoneal. The last is a true hernia of the bladder and is the rarest type. In the first two types the bladder is imbedded in the medial aspect of the sac and it is very difficult to dissect the peritoneum from its surface without opening the viscus. Hence any fatty tissue in this part of the sac should be scrutinized with care before being included in the ligature put round the neck of the sac. Moderate or large bladder herniæ usually give vesical symptoms.



## GYNÆCOLOGY AND OBSTETRICS.

## Intravenous injections of Glucose in Toxæmia of Pregnancy.

PAUL TITUS AND M. H. GIVENS (*The Journal of the American Medical Association*, January 14, 1922), after referring to their previous work, in which they advocated the use of glucose by intravenous injection for patients suffering from serious toxæmia at any time during pregnancy, detail the results of further investigations along the same lines. According to these authors, the usefulness of glucose and other carbo-hydrates, whether administered by vein, mouth or bowel, seems to be based on the fact that in toxæmia of pregnancy there is a carbohydrate deficiency in the maternal organism. This deficiency is due to an unusual demand for carbo-hydrates on the part of the growing fetus, frequently augmented and aggravated by a diminished carbo-hydrate intake resulting from an improperly balanced diet. The reserve store of glycogen in the liver is drawn on in the presence of this carbo-hydrate deficiency and the organ is thus depleted of glycogen. Pathological changes in its cells result from this depletion and its detoxicating and other normal functions are promptly impaired thereby. Disturbances in kidney function are probably secondary to the hepatic changes. Successful results have been obtained by the authors from the use of carbo-hydrates in the treatment of vomiting of pregnancy among sixty-eight patients, in addition to the series of seventy-six previously reported. Therapeutic abortion was performed twice and of these two patients, one woman died of acute yellow atrophy of the liver. They claim immediate clinical improvement in individual patients, as well as a general lowering of the mortality rate in eclampsia. They claim also favourable results in *chorea gravidarum*, pre-eclamptic toxæmia and fulminating toxæmia with *ablatio placenta*. The usual necropsy findings in the liver of patients dying from any toxæmia of pregnancy are distinctly altered if the patient is given an intravenous injection of glucose solution before death. Thus portions of the liver lobules which are ordinarily necrotic, are thereby restored to a great degree and in most instances a diagnosis of eclampsia or pernicious vomiting of pregnancy, as the case might be, could not be made from an examination of the liver sections alone. The regeneration of the liver cells after injection of glucose, which can be demonstrated pathologically in the fatal cases, at least partially restores the normal functions of the liver, especially in regard to its powers of detoxication. Clinical improvement is usually noticeable within a short time after the injection. From 50 to 75 grammes of chemically pure glucose dissolved in from 250 to 500 cubic centimetres of distilled water may be injected slowly without danger of unfavourable reaction on the part of the patient. The

solution should be filtered and sterilized by boiling water, after which it should remain almost colourless. Single doses, repeated as required, are preferable to a continuous flow of solution into the vein. It is thought by the authors that the rate of absorption and storage of the injected sugar is an index of the condition of the liver. Glycæmia curves plotted from blood sugar determinations at stated intervals after injection of glucose show that the sugar is absorbed and stored by some patients more rapidly than in the normal controls, whereas in others the storage is slower than normal. While other organs may possibly be involved, the condition of the liver must be considered as of the greatest importance and significance. In basing a prognosis on the blood sugar curve it must be remembered that the liver has possibly been depleted of glycogen in the course of the toxæmia and may be ready to assume once more its glycogenic function. If the rate of storage is slow this would be an indication of extensive liver necrosis rather than a mere depletion of the cells.

## Fulminant Menstrual Peritonitis.

J. GEORGE ADAMI (*The Journal of Obstetrics and Gynecology of the British Empire*, Volume 29, No. 1, Spring Number, 1922) reports an unusual case in which he was called on to perform a *post mortem* examination on a girl aged fourteen years, who died after an illness of such brief duration that a death certificate was refused. She had been in robust health until the day of her death. Her second menstrual period came on three days before her death. On the third day of this menstrual period she took part in a gymnasium exhibition, swinging herself from ring to ring round the gymnasium and going through other exercises. After the competition she was well. At five o'clock next morning there was acute abdominal discomfort and the pain became more distressing during the morning; she also became feverish. By the afternoon she had passed into an intensely toxic comatose state and died within twelve hours after the appearance of the first symptom. At the *post mortem* examination Adami could find no lesion in any organ or viscus in the body, except that the intestines were wetter than usual and diffusely injected. There was a very definite accumulation of fluid in the pelvic cavity and here also the intestinal coils and the Fallopian tubes were more intensely injected. The fluid was not purulent; it was still translucent, but definitely turbid. As the girl was menstruating at the time of death, he made a special study of the genitalia. The uterus was firm, of normal size, its mucosa reddened and it contained bloodstained fluid, all compatible with simple menstruation. There was no mucus plug closing the cervix. The fimbriae of the Fallopian tubes were in normal position, but were abnormally "angry" in appearance. All that he could determine was an acute generalized peritonitis with evidence of great-

est intensity in the pelvic region. Examination of the peritoneal fluid from the pelvis showed that it contained very few cells, but was practically a pure culture of a streptococcus in long chains. These streptococci were the cause of the turbidity of the fluid. He gave the diagnosis as fulminant menstrual peritonitis. He concluded that, whereas between menstrual periods the uterus is sealed by the cervical plug of mucus, during menstruation the mouth of the uterus and so the way to the Fallopian tubes and peritoneal cavity is open and that by negative abdominal pressure the contents of the vagina may thus under favourable circumstances be sucked into the peritoneal cavity. A single brief period of negative pressure might at most draw the vaginal contents into the mouth of the uterus, but a succession of acts leading to alternative positive and negative pressures in the abdominal cavity, acts such as swinging from ring to ring round the gymnasium, or, again, acts of prolonged negative pressure, such as balancing with feet in the air on the "horse" or parallel bars, would strongly favour the suction of the vaginal contents along the whole length of the female genital canal. The author states that streptococci may exist in the vagina without setting up local lesions and that apparently in this instance such was the case.

## The Two Hegar Signs of Pregnancy.

G. L. MOENCH (*American Journal of Obstetrics and Gynecology*, December, 1921) points out that when Hegar first published his observations on the early uterine changes of pregnancy, he described two very characteristic signs. The first of these is known the world over as Hegar's sign and consists in the softening of the lower uterine segment. The second Hegar sign is the production, by proper technique, of a definite fold in the anterior uterine wall. The latter has not been included in recent text-books. It is easy to elicit the second sign, but help from a second person may be needed to steady the uterus. Retroflexed uteri, of course, have to be replaced before the sign can be elicited. The index finger of the right hand of the examiner pushes up the vaginal wall through the anterior fornix, along the front of the body of the uterus. With the fingers of the left hand counter-pressure is made through the abdominal wall along the front wall of the uterus. If pregnancy is present a transverse fold of the anterior uterine wall is felt to bulge forward between the examining fingers. If the uterus tends to escape backwards, it is steadied by an assistant's hand behind the fundus. The mechanics of the production of Hegar's signs seem to be based on the following factors: (1) Thinning out of the uterine walls. (2) Softening of the uterine walls. (3) An encapsulated fluid content of the uterus. The last factor is the most important. The soft and thin uterine wall moves on and over the wall of the cyst (the amniotic sac) within it.

## British Medical Association News.

### SCIENTIFIC.

A MEETING of the Victorian Branch of the British Medical Association in conjunction with the Australian College of Dental Alumni Society was held at the Walter and Eliza Hall Institute of Research in Pathology and Medicine, Melbourne Hospital, on May 23, 1922. Dr. JOHN GORDON, the President, in the chair.

#### The Organs of Mastication.

Dr. W. STANLEY WILKINSON read a paper entitled "The Development of the Human Dental Mechanism; The Significance of the Deciduous Teeth; Orthodontia as an Aid to Pædiatrics" (see page 83).

#### Oral Sepsis.

Dr. J. KENNETH CLARK read a paper on oral sepsis. He prefaced his remarks by stating that he intended to confine himself to a consideration of apical and gingival lesions which together comprised probably 90% of the pathological conditions dealt with by the dentist. He gave a brief survey of the normal anatomy and physiology of teeth. He pointed out that the pulp, often, but erroneously, called the nerve by the layman, was the organ which presided over the formation and calcification of the dentine. When these processes were completed, the pulp had performed its main function. It could then be removed without great loss to the individual. The removal of the pulp, however, involved the death of the cytoplasmic processes of the odontoblasts. Dr. Clark did not admit that the exposure of the external surface of the dentine after removal of the pulp would provide a better pabulum for the growth of bacteria than would living cytoplasm.

The periodontal membrane was a specialized layer of soft tissue intervening between the cementum covering the root of a tooth and the alveolus. The neck of the tooth was that part of the root which lay between the alveolar margin and the gingival line. The soft tissues were attached to the tooth as far as the gingival line, but the gums were carried beyond this line in the form of a flap for a varying distance. In the space between the teeth the soft tissues were carried up as far as the contact points of the teeth. Some fibres of the periodontal membrane attached to the cementum of the neck of the tooth were inserted into the corresponding portion of the cementum of the adjoining teeth. The loss of one tooth broke the continuity of this fibrous chain and allowed the two free ends to drift. This might have the effect of disturbing the normal occlusion of many other teeth. Other fibres of this portion of the membrane passed from the cementum into the gingivæ or flap of the gum. It was these fibres that held the flaps in apposition to the enamel. When they became damaged, the gingivæ sagged and a gingival trough formed which acted as an open gutter for the collection of food debris.

The physical attachment of the tooth within the alveolus was effected by fibres of the membrane passing from the cementum to the bone. These fibres were arranged in such a manner that slight movement of the tooth within the alveolus could take place. When these fibres were broken or detached, new fibres were thrown out, provided there was a deposition of new cementum. The cementoblasts could not perform their function unless the cementum was physiologically healthy.

The enamel, being ectodermic in origin, was completely covered at the time of eruption by a membrane composed of epithelial cells undergoing keratinization. This membrane, called Nasmyth's membrane, was soon worn off the exposed portion of the enamel. It persisted where the enamel was covered by the gingivæ and in this situation it was probably continuous with the epithelium covering the inner surface of the gingivæ at the bottom of the gingival trough. In this way there was formed an ectodermal covering for the mesodermal tissues. The exclusion of the teeth, the shrinkage of the gingivæ and the absorption of the alveolar margins in adult life led to a breach of continuity of this layer. Dr. Clark held that this provided an explanation of the fact that pyorrhœa was usually a

disease of adult life and that the child escaped from this affliction literally by the skin of its teeth.

The lymphatics situated beneath the epithelium covering the inner surface of the gingivæ passed into the periodontal membrane. Dr. Clark showed that an infective process occurring in the gingival trough was usually carried to the periodontal membrane.

In dealing with lesions at the apex of a tooth he stated that there was usually little evidence to enable the dentist to determine whether the process was infective or sterile. The diagnosis of an apical lesion depended on the presence of subjective symptoms and objective signs. The former comprised tenderness on mastication or on digital pressure over the apical region. The signs included the presence of a fistula, swelling and the presence of a radiolucent area involving the apex of the tooth. In the majority of instances the infection was introduced through the apical foramen. More rarely the micro-organisms were carried to the spot by the blood stream. Dr. Clark held that all they could state with the knowledge possessed at present was that all these lesions might be a source of systemic infection. The majority, however, were harmless, provided that the patient's resistance was satisfactory.

In dealing with gingival lesions three distinct tissues were involved. These were the gingivæ, the periodontal membrane and the alveolar process. The majority of the lesions originated in the gingivæ, but Dr. Clark was convinced that some started either in the periodontal membrane or in the bone. The ætiology of gingival affections was very wide. Some constitutional conditions, such as scurvy, were known to produce a gingivitis. The same was true of certain metallic poisons, such as mercury, lead and bismuth. Pyorrhœa was regarded by some authorities as a symptom of a definite constitutional dyscrasia. It was widely held that microbial infection was a common ætiological factor. The large variety of oral bacteria rendered research work extremely difficult. Few definite results had been obtained. It was also taught by some observers that the majority of gingival lesions were the result of direct or indirect trauma. Nearly everyone admitted that trauma played at least a contributory part in the causation. In some of the conditions the cause was chiefly microbial, as in Vincent's angina, in which the specific spirillum was associated with the fusiform bacillus. This condition at times simulated pyorrhœa alveolaris. A microscopical examination of a smear would clear up the diagnosis. The symptoms of gingival lesions were tenderness, varying from slight pain during mastication to almost unbearable pain, and an unpleasant taste in the mouth. The objective signs were inflammation of the gingivæ, exudation of pus from the troughs, the presence of pus pockets between the root and the periodontal membrane, fetid breath and the signs of rarefying osteitis. The destructive process in the bone was at times rapid and in these cases a ragged margin of the alveolar process was formed. All these gingival lesions might cause systemic infection, but many of them were harmless, provided that the patient's resistance remained good.

In dealing with the evidence of an ætiological relationship between these dental lesions and systemic infection Dr. Clark stated that he could not exclude the possibility that in many, if not all, of the instances quoted in which the removal of septic foci in the mouth had been followed by dramatic cessation of the systemic symptoms, equally satisfactory results might have been achieved had the oral lesions been allowed to remain.

He stated that 95% of apical lesions were the direct results of dental caries. The incidence of dental caries among civilized people was about 97%. Although its direct mortality was nil, its indirect mortality was 97%. He held that almost everyone's life would be prolonged if he and his parents before him had been supplied throughout life with an efficient masticatory apparatus and if that apparatus had been used on a diet such as Nature had intended for man. He ventured to state that few persons existed whose powers of resistance would not be increased.

Dr. Clark claimed that dental caries was preventable, but not by dentists. The prevention was dependent on diet and development. He was confident that if the medical profession would devote half as much attention to dental caries as it devoted to tuberculosis or cancer, the incidence of dental caries would be reduced by half in one

generation and in the third generation the disease would be almost eliminated. With the disappearance of dental caries tuberculosis and cancer would become non-existent.

#### The Relations Between the Doctor and the Dentist.

Dr. J. MONAHAN LEWIS read a paper on the relations between the medical and dental professions. He welcomed the step taken by the Victorian Branch of the British Medical Association in inviting the dentists to meet the doctors and to discuss matters of common interest. He held that the well-being of the patient was of the first importance in every instance and that, even if professional "etiquette" were offended, nothing should be allowed to interfere with attempts to safeguard the patient's interests. An ideal relationship between the members of the two professions must be based on common respect. The members of his own profession of dentistry had looked on medicine as their great exemplar. The growth of dental science was due to the fine traditions which medicine had inherited. He trusted that medical practitioners would realize that dental specialists were doing what they could to stop the ravages of disease. Sir Joseph Verco had said at the Australasian Medical Congress, Brisbane, 1920, that medicine, surgery and dentistry were indissolubly linked together.

Dr. Lewis ventured to offer a practical suggestion. He had long held that one of the chief causes of lack of understanding between medical and dental practitioners would be swept away if the medical curriculum were made to include a short series of lectures on dental surgery and pathology. He used the term dental surgery to imply the study of the conditions which called for operative interference rather than instruction in surgical technique. He realized that the medical student had to undergo a full course of training in pathology, but he held that the knowledge of general pathology could hardly be regarded to cover the knowledge of special pathology. Pathological processes, even if fundamentally identical, might be modified by their situation. A tiny bead of pus in a pustule had a very different significance to a tiny bead of pus on the dental pulp.

The question of *pyorrhæa alveolaris* was the one concerning which medical and dental practitioners frequently failed to regard in the same light. The patient was often sent to the dentist with directions that certain teeth or all the teeth should be removed. The medical practitioner frequently refused to listen to any suggestion of conservative treatment. Often the medical diagnosis was seemingly made on a superficial examination. A little congestion of the gum, coupled with the presence of some salivary calculus, was regarded as sufficient to condemn all the teeth in the neighbourhood, while real *pyorrhæa* was at times overlooked, since the investing tissue appeared to be normal.

The dentist left to the medical practitioner the assessment of the damage caused by septic conditions in the mouth. He put forward a plea that dental opinion should decide whether or not a *pyorrhæa* or an infective apex existed. A dogmatic assertion concerning the condition of the mouth by a medical practitioner might have serious consequences because of the weight attached to his opinion and because of the intimate relation he had with his patient. Dr. Lewis thought that much misunderstanding and much mischief might be obviated by a word over the telephone or, better still, by a letter written by the medical practitioner to the dentist describing the patient's condition and indicating what the latter desired.

Some of his friends had been seriously confronted by a medical man with the term "dry *pyorrhæa*." He hoped that by referring to such a term, it would be killed. It was obvious that the expression was intended to describe a particular phase of gum recession not accompanied by pus formation. Dr. Lewis spoke feelingly concerning the use of the word *pyorrhæa*. At times it had but to be breathed into a patient's ear and he would be most anxious to have an important part of his digestive apparatus removed. It should be admitted that *pyorrhæa* might be so urgent that it would be preferable to make the mistake of removing healthy teeth rather than risking the retention of a source of danger. In the large proportion of instances no harm would come to the patient if the dentist were given an opportunity of trying conservative measures.

He often wondered whether it were realized how important natural teeth were. He held that there was con-

siderable doubt whether the teeth were to blame in the majority of cases of gastric ulcer. He referred to the condemnation of wholesale extraction of teeth which had been published a few months before in *The Lancet*. If dental problems in pathology were to be met on every occasion by radical surgical measures, all progress along curative lines would cease. He therefore pleaded for patience and team work.

Before concluding, he wished to emphasize the benefit that would accrue to the patient if, when an extensive operation on the jaws was contemplated, the dentist were called in. This would enable the dentist to devise the appliances which might be used to replace the lost structures. Work of this kind was always difficult and was rendered needlessly complicated when the parts were deflected from their normal relationship by the pull of muscles and the contraction of scar tissue.

In approaching the second point of his address, namely, the question of the cooperation which should be developed between medical and dental practitioners in attacking problems of common interest, he asked that medical men should regard dento-medical problems with a live interest. If dental and tonsillar diseases could be banished by the wave of a wand, the origin and point of entry of many diseases would be abolished and they would not see many men and women broken in late middle life by toxæmia. There were dental problems intricate enough to requisition the best work of the physician, the bio-chemist, the physiologist, the chemist and the physicist. He urged that medical and dental science should come more closely together and that their common problems should be attacked in concert. It had seemed to him that this objective would be reached the sooner if the Victorian Branch of the British Medical Association would create an external membership for dental practitioners. These external members would pay a fee, but have no right to vote and no permission to take part in medico-political discussions. Much good might result and a better understanding might arise between the members of the two allied professions.

#### Discussion.

Dr. BRYAN FOSTER made some observations on the facial deformity of children which resulted from neglected nasal obstruction. As Dr. Wilkinson had emphasized, when the deformity was the outcome of adenoid vegetations in the naso-pharynx, their removal was not sufficient to remedy the disfigurement.

Dr. Foster urged the early removal of adenoid growths; no matter how young the child, if nasal obstruction could be shown to be dependent on this cause, indication for operation existed. If properly removed, adenoid vegetations should rarely recur in such degree as would cause trouble and by early removal facial deformity from this source would be obviated.

Dr. SYDNEY PERN discussed the statement of Dr. Clark that many radiolucent apical areas had been found to be sterile on investigation. He referred to the recent work by Rosenow, who had claimed to have cultivated anaerobic streptococci from foci which by less exhaustive examination would be classed as sterile. Doubt had been expressed as to whether apical or gingival sepsis demonstrated in the presence of constitutional disease necessary stood in causal relation to such general ill-health. An individual harbouring virulent streptococci in a focal infection could continue to perform his daily duties as long as his immunity reactions did not fail. So could a syphilitic, but pathological processes were advancing all the time. Sooner or later the organisms of a focal septic process would get the upper hand. Dr. Pern maintained that 25% of focal infections responsible for constitutional disease were dental. It was the duty of the medical profession to point out the ravages of micro-organisms and the part of the dental profession to devise ways and means of dealing with them.

Mr. FAY MACLURE remarked that orthodontia and orthopedics were based on the same fundamental principle, *viz.*, Wolff's law, that bone was laid down in direct proportion to the stresses and strains to which it was subjected. Mr. MacLure drew an interesting comparison between the work of the orthopædist and that of the orthodontist and inquired of Dr. Wilkinson if there was any age limit to the advantageous use of the appliances of the orthodontist.



He further asked if the principles of orthodontia had been applied to the reduction of the gap in cleft palate as a preliminary to operation. With reference to Dr. Lewis's paper, Mr. Maclure said that he was afraid that in the past the dentist had not always received from the doctor the consideration that was his due. That this had been so indicated a lack of appreciation on the part of the doctor of the thorough and scientific training received by graduates in dentistry.

MR. VAL MACDONALD said that he had noted a continuity of thought in the three papers which had been presented. Dr. Wilkinson had shown the great importance of correct alignment and accurate cusp and incisor relationship. Neglect and failure in these respects led to faulty development, impaired function and all the attendant ills. Thus they reached the subject of oral sepsis treated by Dr. Clark and it was particularly in this field that the work of the medical and dental professions overlapped. The ideal relationship between the two professions on this common ground had been admirably outlined by Dr. Lewis.

An instance of what might be achieved by cooperation between members of the medical and dental professions had recently been provided in Sydney by the work of Dr. H. C. Moxham, dentist, and Dr. Leslie Utz, bacteriologist. In a recent number of the *Dental Science Journal* articles by these two collaborators had shown that a hæmolytic streptococcus was to be recovered from 90% of all dental abscesses and that such streptococci could be destroyed by the use of cultures of *Bacillus bulgaricus*. Clinical experience had confirmed the laboratory tests and it appeared that a valuable means of treatment had been provided.

Mr. Macdonald referred to Sir William Hunter's recent communication in *The British Medical Journal* on pernicious or "glossitic" anæmia. He said that, originally holding oral sepsis as of supreme importance in the causation of this disease, Sir William Hunter had restated his views in this respect the more forcibly because of the lapse of all the years since he had first emphasized the ætiological relationship of oral sepsis to pernicious anæmia.

His professional relations with medical men had always been of the happiest nature; misunderstandings between doctor and dentist would not arise if each had a due appreciation of the other's work. He urged that when a patient was referred by his medical attendant to the dentist, the latter should always report directly to the medical man and not through the medium of the patient.

DR. A. L. KENNY said that he wished to congratulate the prime movers in arranging such an interesting and happy meeting. The question of adenoid vegetations had been under discussion and it was to be remembered that their growth was not always a primary disease. The appearance of adenoid vegetations might be determined by some of the conditions dealt with by Dr. Wilkinson. In such circumstances simple removal of adenoids was clearly not enough.

The suggestion of Dr. Lewis that medical students should receive some special training in dental surgery and pathology might be adopted with great advantage if it were possible to add to it an already over-weighted course. The Victorian Branch of the British Medical Association should devise some means by which members of the medical and dental professions might have opportunity for regular discussion of their common problems and he hoped that the Council of the Branch would consider what steps might be taken in this direction. Dr. Lewis had put the case for cooperation between dentists and medical men in an able and unexceptionable manner.

MR. ERIC YULE in some remarks illustrated by a lantern slide exhibiting six radiograms, indicated the necessity for curettage as supplementing extraction in certain types of apical sepsis.

DR. J. E. NIHILL said that in view of the scientific training of the dental student and from long experience of the work qualified dentists were competent to perform, he felt very strongly that the status of the dentist should be that of a specialist. He was afraid that the introduction of a measure of dentistry into the medical student's course might in the long run be mischievous. Medical men might then be tempted to undertake dental work or to express opinions on questions of dentistry on insufficient training and experience.

DR. A. V. M. ANDERSON said that the meeting itself was an encouraging instance of the cooperation which was very necessary between the medical and dental professions. He was in a complete agreement with the view that the dentist should be regarded by the medical man as a brother scientific practitioner with whom the welfare of the patient was to be discussed. Such an attitude towards the dental profession was taught to medical students in the Melbourne University in the course of lectures on medical ethics. Undoubtedly a knowledge of special dental pathology would be a valuable adjunct to the equipment of all medical men.

He was of the opinion that benefit in general ill-health more frequently followed the eradication of dental septic foci than measures directed towards the extirpation of septic processes elsewhere, but they had always to be prepared for disappointments. It could not always be promised that the removal of a focal infection would rid the patient of constitutional disease. At the same time, if a pathological local condition needing treatment were discovered it should be treated.

Dr. Anderson referred to a former happy association with Dr. Lewis in military work and asked his opinion of the pathological significance of fuso-spirillary gingivitis, a condition which had appeared with great frequency among the troops during the war.

DR. R. J. BULL made the suggestion that in order to provide dental students with a more detailed bacteriological training a special lecturer or demonstrator should be appointed to assist him with the dental classes. Such an advance would be the more speedily effected if the proposal gained the practical support of the dental profession.

DR. JAMES BOOTH asked the present view taken by the dental profession of Sim Wallace's teachings regarding the part played by inappropriate diet in the production of dental caries.

Other speakers who contributed to the discussion were MR. P. MATTHEWS and DR. GERSHON BENNETT, of the Dental Alumni Society, and DR. A. P. DERHAM and DR. R. M. DOWNES, C.M.G.

DR. W. STANLEY WILKINSON, in reply, said with reference to the questions asked by Mr. Maclure that there was no age limit to the movement of an individual tooth, but orthodontic procedures dependent for success on the regeneration of bone should be carried out before the age of thirteen or fourteen years.

He had no experience in attempting reduction of the gap in the cleft palate. The view of Sim Wallace referred to by Dr. Booth seemed a rational teaching. It was that the diet ordinarily prescribed for young children was such as would be appropriate to a toothless race. Pulpy foods called for no exercise of the teeth and jaws; the child was endowed with a full set of teeth at the age of twenty-two months and such teeth were designed for use in vigorous mastication. Many irregularities were due to lack of function consequent on the administration of a diet which demanded little or no mastication.

DR. J. KENNETH CLARK referred to Dr. Pern's statements regarding streptococci demonstrated by Rosenow in dental foci; he thought that even Rosenow would not claim that every radiolucent area contained pathogenic microorganisms.

The hour was too late to discuss preventive measures against dental caries as requested by Dr. Downes.

Dr. Clark concluded with an earnest appeal to the medical profession to use all its influence to obtain provision for research into the causes underlying dental caries.

DR. J. MONAHAN LEWIS expressed his appreciation of the manner in which his paper had been received. He was afraid there had been a little misconception of his exact meaning when he suggested that medical students should be taught a measure of dental surgery and pathology. He recognized that the medical curriculum was very full, but at the same time an appreciation by medical men of the problems of dental surgery (he did not include operative surgery) and the special dental pathology would go far towards establishing that cooperation and understanding between the two professions which was so eminently desirable.

It had been his privilege to be closely associated with Dr. A. V. M. Anderson during the war, when they had been required to deal with numerous soldiers infected with

the fusio-spirillary organisms. Dr. Lewis said that, while knowledge of the pathogenic activities of the various spirillæ found in the gingival trough was very imperfect, on clinical grounds he had come to regard spirillæ with great suspicion as the exciting causal agents of the initial lesions of pyorrhœa. "Vincent's angina" in its acute form was not likely to be mistaken, but in its more chronic and indolent phase it might be loosely termed "pyorrhœa" if the real significance of the lesions were not appreciated.

He was grateful to Dr. Kenny for his favourable comment on the suggestion that means be devised for regular joint discussions of matters of common interest to dentists and medical men and hoped to see the project consummated.

THE inaugural meeting of the Section of Neurology and Psychiatry of the Victorian Branch of the British Medical Association was held on June 26, 1922.

#### Election of Office-Bearers.

The following were elected office-bearers and members of the Executive Committee:

*President:* DR. W. ERNEST JONES.

*Honorary Secretary:* DR. PAUL DANE.

*Members of Committee:* DR. JEAN GREIG, DR. W. A. T. LIND and DR. J. W. SPRINGTHORPE.

#### Inaugural Address.

DR. J. W. SPRINGTHORPE delivered an inaugural address on "Psychology, Its Basis and Application."

#### NOTICES.

THE COUNCIL OF THE VICTORIAN BRANCH OF THE BRITISH MEDICAL ASSOCIATION has arranged the following provisional programme of the Branch meetings. The Scientific Committee reserves to itself the right to modify the arrangements, but it is hoped that no changes will be necessary.

#### August 2, 1922.

At the Walter and Eliza Hall Institute of Research in Pathology and Medicine, Melbourne Hospital, at 8.15 p.m.

MR. FRED D. BIRD, C.B.: "Note on a Form of Pelvic Hydatid Cyst and its Treatment."

DR. VAL MACDONALD: "Pathological Dentition as a Pathological Entity" (illustrated by lantern slides).

#### September 6, 1922.

CLINICAL MEETING at St. Vincent's Hospital, Melbourne, at 8.15 p.m..

#### October 4, 1922.

At the Walter and Eliza Hall Institute of Research in Pathology and Medicine, Melbourne Hospital, at 8.15 p.m.

DR. H. DOUGLAS STEPHENS: "Clinical Symptoms of Enlargement of the Spleen in Children."

DR. S. O. COWEN: "Familial Splenomegaly."

DR. K. HILLER will open the discussion.

#### November 1, 1922.

CLINICAL MEETING at the Children's Hospital, Carlton, at 8.15 p.m..

#### NOMINATIONS AND ELECTIONS.

THE undermentioned has been elected a member of the Victorian Branch of the British Medical Association:

REID, WILLIAM BREMNER, M.B., Ch.B., Edin, 1921, Warrandyte.

#### Obituary.

#### JOSEPH HINES WOLFENDEN.

WE have to announce the death of Dr. Joseph Hines Wolfenden, of Malvern, Victoria, which took place on July 5, 1922.

## Medical Societies.

### MELBOURNE PÆDIATRIC SOCIETY.

(AFFILIATED WITH THE VICTORIAN BRANCH OF THE BRITISH MEDICAL ASSOCIATION.)

A MEETING of the Melbourne Pædiatric Society was held at the Children's Hospital, Melbourne, on May 10, 1922, the President, DR. R. L. FORSYTH, in the chair.

#### Diabetes Mellitus.

DR. H. BOYD GRAHAM read a paper on the "Management of Diabetes in Children" (see page 89).

DR. S. W. PATTERSON said that the subject of diabetes in children had been so well introduced from the clinical aspect that in this respect he found little to add. It might be of interest, however, if he reviewed briefly some of the more important experimental studies directed towards the elucidation of the perverted metabolism which constituted *diabetes mellitus*. He had been impressed with the similarity obtaining between diabetes in children and young adolescents and the experimental disease produced in dogs by extirpation of the pancreas. It was interesting to note how very acute had been the onset in the patients discussed by Dr. Graham; after pancreatectomy in dogs the animals rapidly wasted and pursued a progressive downward course, while within an hour or two of the operation glucose to the amount of 3% to 5% appeared in the urine.

The essential problem in diabetes was to determine the underlying morbid condition. Two hypotheses had been advanced, the first—strongly advocated by Pavy—that the fundamental change was an over-production of sugar and the second that the disease arose from a lack of power of the tissues to utilize dextrose normally produced. Various experimental attempts had been made with the object of estimating the balance between these factors.

In studies conducted by Minkowski, who maintained a depancreatized dog in such condition that there was a constant elimination of sugar and no carbo-hydrate intake, it had been shown that if a measured amount of glucose were given to such an animal, the whole quantity could be recovered from the urine. The inference drawn was that the essential underlying pathological change was defective utilization of glucose by the tissues.

Starling, by means of heart-lung preparations in normal and diabetic animals, had investigated this same factor of defective utilization. While the earlier experiments seemed to show that the diabetic heart, when perfused with Locke's solution and added dextrose, consumed less sugar than the normal heart, later results established that the tissues of depancreatized animals, when perfused with Locke's solution and dextrose, were quite as able to consume the sugar as those of normal animals.

The results of studies on the respiratory quotient, however, seemed to point to inability of the tissues to consume glucose. The oxygen and carbon dioxide exchange between the lung and the inspired air was estimated by means of "heart-lung" preparations and by observations on the whole animal resting quietly in a respiration chamber. The ratio between the amount of carbon dioxide exhaled and that of oxygen consumed in the inspired air, was known as the "respiratory quotient." It was possible by determinations of this quotient to arrive at conclusions relating to the character of the materials undergoing combustion. Thus, when carbo-hydrate was burned, the respiratory quotient

$\frac{\text{CO}_2 \text{ excreted}}{\text{O utilized}} = 1$ ; the quotients for the combustion of proteins and fats were 0.72 to 0.74 and 0.702 respectively.

When carbo-hydrate was given to a diabetic dog resting quietly in a respiration chamber to which oxygen had been added, no rise in the respiratory quotient could be determined and the conclusion to be drawn from this and similar experiments was that the tissues of such an animal were unable to utilize dextrose.

Dr. Patterson concluded with a brief reference to studies upon the ratio of glucose to nitrogen in the urine in diabetes.

DR. IVAN MAXWELL contributed some remarks relative to the bio-chemical aspects of diabetes. He pointed out that it had been established that a certain small degree of glycosuria was almost constant in normal individuals, but the methods commonly in use, depending on the use of solutions such as Benedict's and Fehling's, were not sufficiently delicate to detect it.

Glycosuria referable to lesions of the pancreas, endocrine glands and thoracic autonomic nervous system, as also the glycosuria following asphyxia and anaesthesia, was accompanied by a hyperglycaemia—a condition which could be accurately gauged by the Maclean method for the estimation of blood sugar.

An individual fasting overnight showed glucose to the amount of one part per thousand in his blood; after a carbohydrate meal this amount rose, but not to such an extent that detectable sugar appeared in the urine. The administration of one hundred grammes of glucose should not give rise to clinical glycosuria, a point which was reached when the blood sugar exceeded the figure of 0.16%. This figure was spoken of as the "renal threshold" and varied in different individuals. For example, in the so-called "renal diabetes" or *diabetes innocens*, when the blood sugar exceeded 0.1%, sugar appeared in the urine, while other individuals exhibited a high renal threshold (0.2%). In many diabetics the renal threshold had been found to rise after a time and it had been a subject of discussion whether such rise indicated damage to the kidney or the establishment of a protective mechanism designed to curtail the loss of glucose.

In some remarks on the acetone bodies Dr. Maxwell referred to the patient discussed by Dr. Graham in whom the introduction of four grammes of fat into a diet which was maintaining her sugar-free, caused an immediate appearance of acetone and diacetic acid in the urine. In dogs rendered diabetic experimentally, acetone bodies in the urine in the early days appeared in minimal quantity, but after the lapse of ten days these substances tended to rise in amount, thus suggesting defective oxidation of the fats.

The amino-acids of protein were to be regarded as breaking down in two ways, one through the carbohydrate molecule and the other by way of fat and its ultimate oxidation. If the latter process were incompletely effected, the patient would be hard put to it to avoid the consequent toxemia and the sequence of events which terminated in coma.

In regard to the condition in which glucose existed in the blood stream, Dr. Maxwell stated that the most recent teaching on the subject was that it was present in a crystalloid diffusible form and not attached to a colloidal complex as had hitherto been understood. There was no doubt that in diabetics the fat metabolism was perverted together with that of carbohydrate and in this connexion it was to be noted that the Rothera test for acetone bodies in the urine was really a test for diacetic acid rather than for acetone, in that it would detect the former in a concentration of one in 400,000 and the latter in a concentration of only one in 20,000. Aceto-acetic acid was unstable and was soon converted into acetone; the clinical test with perchloride of iron would not detect aceto-acetic acid in concentrations of less than one in 14,000. Some time ago he had drawn attention to the fact that the ingestion of bicarbonate of soda by a normal person led to the production of a reddish brown coloration in the urine on the addition of ferric chloride. This was a reaction which anyone might easily verify and he had no doubt that it had been the cause of much confusion, particularly when patients had been given alkalies to combat "acidosis" and the ferric chloride test had been employed to gauge the effect of treatment.

It was to be remembered that the hydrogen ion concentration of the blood did not alter very much owing to the presence of so many "buffer" substances; a variation of hydrogen ion concentration in the blood as great as that represented by the difference between distilled water and tap water in respect of hydrogen ion would be incompatible with life. Determinations of hydrogen ion concentration, therefore were of little use in the investigation of "acidosis."

The utility of alkalies in treatment was still in dispute and it had been suggested that aceto-acetic acid was the

most potent factor in the production of coma. On this compound toxicity was considered to lie not so much in the COOH or acetic acid radicle as in the COH-CH or inolic group. If such were the case, alkalies were not likely to be of great assistance, as they did not deal with the COH-CH grouping; at the same time, the alkali reserve was diminished by the presence of the acetic acid group—COOH—and it would seem reasonable to maintain it by the administration of alkalies.

In conclusion, Dr. Maxwell said that the chief purpose of his remarks had been to direct attention to four points: (i.) That glucose was constantly being passed by normal persons in amounts less than 1%. (ii.) That many variations had been demonstrated in renal permeability. (iii.) That the best test for diacetic acid was the Rothera test. (iv.) That the toxic factor in the diacetic acid molecule was now considered to be in the inolic group.

DR. R. L. FORSYTH asked for information regarding the composition and utility of "diabetic bread" and remarked that a really useful diabetic bread would be of great value, as it was disconcerting to find how little ordinary bread a diabetic child could take without suffering ill-effects.

DR. H. DOUGLAS STEPHENS said that, although his experience of diabetes in children had not been large, it had been very disappointing, as, sooner or later, the disease had always ended fatally. It appeared that the mortality rate was higher the younger the child at the onset of symptoms. The youngest patient with glycosuria he could recollect was an infant eight hours old, who could not be roused and whose urine he found loaded with sugar. This occurred in March, 1921; the baby had grown into a healthy specimen.

Temporary glycosuria in children was occasionally observed and he had been informed that in the western district of Victoria such temporary glycosuria occurred quite commonly during the grape season.

He would like to have defined a clear-cut clinical course to pursue in the presence of coma. He had found the present diversity of teaching regarding the use of alkalies very confusing.

As an example of the fulminating course sometimes observed in diabetics in children, Dr. Stephens mentioned the case of a little girl for whom he had reduced a congenital dislocation of the hip at the age of three years. Some time afterwards the child was brought back in ill-health; sugar was present in the urine and she was dead within five days. The majority of the diabetic children he had seen had exhibited some degree of reaction in the blood serum to the Wassermann test and he had been led to wonder whether children affected with a congenitally syphilitic taint were especially prone to diabetes.

In conclusion, Dr. Stephens invited suggestions for dealing with severe degrees of acid intoxication, in which the child became very pallid, vomited incessantly, displayed air hunger and gave forth a strong smell of acetone in the breath. He had seen four such children die within the last twelve months.

DR. LIONEL HOOD said that it would appear that, in spite of Allen's treatment, the prognosis of diabetes in children was still exceedingly bad. The patients so carefully managed by Dr. Graham had all left hospital apparently well and all had died within twelve months. They were buoyed up by hope occasionally, but the end was always the same. They could prolong life and get the patients to a certain stage of amelioration of their condition, but it could not be said that diabetes could be cured.

In the various endeavours to control the metabolism in diabetes was there sufficient attention paid to the endocrine glands? If it were possible to regulate the activity of the thyroid and adrenals, the output of the internal secretion of the pancreas might thereby be modified.

DR. CECIL TUCKER said that one of the difficulties of the general practitioner in managing diabetes was the necessary daily quantitative estimation of the sugar present in the urine. He had recently adopted and was so far well impressed by a simple colorimetric method devised by Parnell. Estimations of the amount of sugar present could be made in the home by this method. He would be interested to learn if anybody else present had employed the Parnell colorimeter and had arrived at any conclusion regarding its value.



With reference to the fallacy pointed out by Dr. Maxwell in the test for diacetic acid in the urine by the addition of *liquor ferri perchloridi* when the patient was receiving alkalies, he wished to ask if the same or a similar error was likely to occur with the nitro-prusside reaction.

When faced with the necessity for eliminating ordinary butter from the diet of diabetics and generally reducing the fat intake, he had resorted to pea-nut butter. This preparation was tasty and he had found that in small amounts it did not lead to any increase in the amount of sugar in the urine.

DR. STEWART FERGUSON expressed himself as bitterly disappointed with the results that he had experienced in scrupulous supervision of diabetic children. There was no doubt that the Allen régime represented a great advance in the treatment of diabetes in adults, but when applied to children it was very disappointing. The reason for this would seem to lie in the fact that in the child it was necessary to consider more than the maintenance of nutrition and to make provision for growth and development. Restriction of diet to a degree necessary to keep juvenile diabetics sugar-free also operated to render them little more than living skeletons.

In various ways these children suffered from the results of treatment; the large amount of vegetable fibre which they ingested was prone to lead to chronic intestinal indigestion. They were also very prone to intercurrent affections. Altogether, he could not but regard the outlook in juvenile diabetes with pessimism.

MR. C. W. B. LITTLEJOHN remarked that in considering diabetes from the point of view of the problems in physiological chemistry involved, it had occurred to him that possibly the faulty metabolism of carbo-hydrates had been over-emphasized and that perhaps not sufficient attention had been paid to the perverted metabolism of the fats. Whatever defects in the metabolism of carbo-hydrates contributed to the diabetic state, it seemed clear that a failure in the normal chemistry of the fats precipitated the fatal issue. He was not aware that any explanation had ever been given for the failure of fat metabolism and inquired if any work relating to this morbid process had ever been attempted on a plan similar to that adopted by Cohnheim in his original work on the part played by the pancreas in carbo-hydrate metabolism.

DR. H. BOYD GRAHAM in reply said that he had interested himself in the subject of "diabetic" breads, but had not used these preparations to any extent; in fact, he had limited them to the sphere of a placebo.

He had no experience of the use of pea-nut flour, but had noted a formula by which a home-made bread substitute was prepared from pea-nut flour, casein and white of egg. In this formula a flour made from monkey-nuts might replace the pea-nut flour.

Other substitute foods for use in diabetes had been manufactured from soya-bean, such as a soya-bean milk, cheese and an imitation of coffee.

In the management of diabetes in children articles of diet such as cakes, scones, bread and butter should be strictly proscribed.

As regards the best course to pursue in the presence of coma, he had come to no conclusion upon the point.

Dr. Hood had introduced the subject of the endocrine glands. It would seem that the thyroid, pituitary and adrenal glands comprised a group which normally antagonized the pancreas and para-thyroids, but that in diabetes there was a disturbance of the balance, owing probably to the pancreatic deficiency. It was noteworthy that diabetic children under treatment had a persistently subnormal temperature, but this clinical feature might be ascribed to under-nutrition rather than to sub-thyreoidism. There would, however, appear to be some degree of hyper-adrenalism, as evidenced by the unstable temperament and tendency to emotionalism which he had observed in diabetic children.

His experience with the Parnell colorimetric method for the estimation of sugar in the urine had been favourable and in general he had found that the readings obtained were within 0.25% of those obtained by a control "Pavy" estimation.

With Dr. Littlejohn he felt strongly that fat intolerance was a large factor in the perverted metabolism of diabetic children.

## Correspondence.

### THE ANALYTICAL DEPARTMENT REPORT ON "LACTOGEN."

SIR: We have read with great interest the report issued in THE MEDICAL JOURNAL OF AUSTRALIA of last week and trust we may be permitted the liberty of a few remarks anent this, especially in view of the statement in your report which reads: "It must be understood that we have no knowledge whether the conditions described exist at the present time." We hope by so doing it will be of interest to your readers.

In all our factories manufacture is conducted on essential principles, the main features of which reflect on the qualities of the products turned out. Therefore, as these constitute a great deal of work, such factories which are taken over by our company, as the factory in question happened to be just prior to inspection, a certain time elapses until the effect of this systematic control is felt. In a milk product such as "Lactogen," sanitation in every phase is important and our endeavours in this respect start at the farms of the suppliers, where inspections are made by skilled farm inspectors. The duties of these men are to enforce the rules and regulations laid down for the care and handling of milk and, provided the supplier is amenable to it, educate him in the production of milk suitable for our manufacture. We reserve the right to reject all milk which will detract from the quality of our product.

We, further, endeavour to make the factory and its equipment reflect the same sanitary conditions which we ask the farmer to live up to, complete instructions to this effect being issued to all our factories.

A systematic control is in force at the factories towards our obtaining milk of undoubted quality, acidity tests, detection of undesirable bacteria, proportion of dirt, etc., in the suppliers' milk being included in the various determinations made. This control is also intended to include determinations regarding the composition of the finished article. In other words, the general trend of our efforts is to insure that only such batches which reflect the best possible product as regards quality and uniformity, are submitted to the public as "Lactogen."

A fully equipped laboratory is in operation in Sydney, with a competent staff under whose jurisdiction the various factories operate, while chemical and bacterial investigations are carried out where the necessity arises.

While essentially the process of manufacture is the same as that outlined in your inspector's report, the inclusion of the foregoing features in the manufacture of our product cannot help but improve its quality and uniformity.

Yours, etc.,

NESTLÉ AND ANGLO-SWISS CONDENSED MILK CO.  
(AUSTRALASIA), LTD.,

H. W. HOLDEN, Director.

347, Kent Street, Sydney,  
July 11, 1922.

### RESTORATION OF THE ROUND LIGAMENTS.

SIR: In a paper published in THE MEDICAL JOURNAL OF AUSTRALIA, June 17, 1922, Dr. H. A. Powell discusses "some operations on the round ligaments" and finally sets out seven considerations which should influence the surgeon in choosing the best operation for retroversion of the uterus. In my experience, the simplest and most effective intra-abdominal operation for shortening the overstretched round ligaments, while at the same time completely fulfilling all the conditions laid down as the ideal by Dr. Powell, is that briefly described and figured by me in *The Lancet*, July 31, 1915. This operation (restoration of the round ligaments) consists in splitting the anterior leaf of the broad ligament parallel to the round ligament and undermining and closing the opening by a purse-string. The immediate effect is to bring the retroverted uterus into ante-version and to demonstrate the round ligaments contracted down to their normal dimensions—an interest-

ing physiological experiment performed directly under the eye. The onlooker would now find it difficult to discover that any surgical procedure had been carried out. I have performed this operation even during the sixth week of pregnancy without interruption of gestation and without recurrence of retroversion after parturition. Only this week, too, I have opened a case in the Perth Hospital in which I had carried out the operation some years ago and in which there had been an intervening parturition. The uterus was in normal position and there was nothing to indicate the primary operation. In another case, however, in which a Montgomery-Gilliam had been done several years earlier, hysterectomy proved exceptionally difficult on account of the anatomical distortion in the pelvis caused by the first operation.

Yours, etc.,

ARTHUR J. NYULASY.

Perth, June 24, 1922.

### Books Received.

SELECTED WORKS OF THOMAS SYDENHAM, M.D., by John D. Comrie, M.A., B.Sc., M.D., F.R.C.P. (Edin.); 1922. London: John Bale, Sons & Danielsson, Limited; Crown 8vo., pp. 153, with four plates. Price: 8s. 6d.

THE PRACTICE OF MEDICINE IN THE TROPICS, by Many Authorities; Edited by Lieutenant-Colonel W. Byam, O.B.E., and Major R. G. Archibald, D.S.O.; Volume II; 1922. London: Henry Frowde and Hodder & Stoughton; Royal 8vo., pp. 1,683, general index, 31 coloured plates and 246 figures in the text. Price: £4 4s. net.

### Medical Appointments.

DR. C. CUNNINGHAM (B.M.A.) has been appointed on probation as a medical officer in the Department of Public Instruction, Victoria.

DR. S. G. ICKTON (B.M.A.) has been appointed Government Medical Officer at Picton, New South Wales.

THE undermentioned appointments in the Adelaide Hospital have been gazetted: DR. A. M. CUDMORE (B.M.A.), DR. W. R. CAVENAGH-MAINWARING (B.M.A.) and DR. H. S. NEWLAND, C.B.E., D.S.O. (B.M.A.) as Honorary Surgeons; DR. A. W. HILL (B.M.A.) and DR. H. F. SHORNEY (B.M.A.) as Honorary Ophthalmologists; DR. BRONTE SMEATON (B.M.A.), DR. M. L. SCOTT (B.M.A.) and DR. J. CORBIN (B.M.A.) as Honorary Assistant Surgeons; DR. H. K. FRY (B.M.A.) as Honorary Neurologist; DR. HELEN M. MAYO (B.M.A.) as Honorary Bacteriologist.

THE undermentioned have been appointed Resident Medical Officers at the Adelaide Hospital: DR. CONSTANCE FINLAYSON (B.M.A.), DR. W. A. FLEMING, DR. H. A. MCCOY, DR. W. R. GRIFFITHS (B.M.A.), DR. W. GILFILLAN (B.M.A.).

DR. R. CUTTLE (B.M.A.) has been appointed Medical Officer of Health by the Leonora-Malcolm Road Board, Western Australia.

DR. L. J. HUNTER, M.C. (B.M.A.), has been appointed Government Medical Officer at Bellingen, New South Wales.

DR. F. N. WADDELL (B.M.A.) has been appointed Government Medical Officer at Dora Creek, New South Wales.

THE undermentioned have been appointed by the Board of Health of New South Wales as Inspectors under the *Cattle Slaughtering and Diseased Animals Act, 1902*: DR. R. M. ALLPORT (B.M.A.), at Gulgong; DR. S. G. ICKTON (B.M.A.), at Picton; DR. E. TRENERRY (B.M.A.), at Pambula.

### Medical Appointments Vacant, etc.

FOR announcements of medical appointments vacant, assistants, locum tenentes sought, etc., see "Advertiser," page xviii..

THE ROYAL SOCIETY OF LONDON: Foulerton Research Professorship.

### Medical Appointments: Important Notice.

MEDICAL practitioners are requested not to apply for any appointment referred to in the following table, without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, 429, Strand, London, W.C.

BRANCH.	APPOINTMENTS.
NEW SOUTH WALES: Honorary Secretary, 30 - 34, Elizabeth Street, Sydney	Australian Natives' Association Ashfield and District Friendly Societies' Dispensary Balmain United Friendly Societies' Dispensary Friendly Societies Lodges at Casino Leichhardt and Petersham Dispensary Manchester Unity Oddfellows' Medical Institute, Elizabeth Street, Sydney Marrickville United Friendly Societies' Dispensary North Sydney United Friendly Societies People's Prudential Benefit Society Phoenix Mutual Provident Society
VICTORIA: Honorary Secretary, Medical Society Hall, East Melbourne	All Institutes or Medical Dispensaries Australian Prudential Association Proprietary, Limited Manchester Unity Independent Order of Oddfellows Mutual National Provident Club National Provident Association
QUEENSLAND: Honorary Secretary, B. M. A. Building, Adelaide Street, Brisbane	Brisbane United Friendly Society Institute Hampshire District Hospital, Kurildala, North Queensland Stannary Hills Hospital
SOUTH AUSTRALIA: Honorary Secretary, 12, North Terrace, Adelaide	Contract Practice Appointments at Renmark Contract Practice Appointments in South Australia
WESTERN AUSTRALIA: Honorary Secretary, Saint George's Terrace, Perth	All Contract Practice Appointments in Western Australia
NEW ZEALAND (WELLINGTON DIVISION): Honorary Secretary, Wellington	Friendly Society Lodges, Wellington, New Zealand

### Diary for the Month.

JULY 25.—New South Wales Branch, B.M.A.: Medical Politics Committee; Organization and Science Committee.  
 JULY 26.—Victorian Branch, B.M.A.: Council.  
 JULY 27.—South Australian Branch, B.M.A.: Branch.  
 JULY 27.—Brisbane Hospital for Sick Children: Clinical Meeting.  
 JULY 28.—New South Wales Branch, B.M.A.: Branch.  
 JULY 28.—Queensland Branch, B.M.A.: Council.  
 AUG. 2.—Victorian Branch, B.M.A.: Branch.  
 AUG. 4.—Queensland Branch, B.M.A.: Branch.  
 AUG. 8.—New South Wales Branch, B.M.A.: Ethics Committee.  
 AUG. 9.—Western Australian Branch, B.M.A.: Council.  
 AUG. 9.—Melbourne Pædiatric Society.  
 AUG. 10.—City Medical Association, New South Wales.  
 AUG. 10.—North-Eastern Medical Association, Bangalow, New South Wales.  
 AUG. 11.—New South Wales Branch, B.M.A.: Clinical Meeting.  
 AUG. 11.—Queensland Branch, B.M.A.: Council.  
 AUG. 11.—South Australian Branch, B.M.A.: Council.  
 AUG. 15.—New South Wales Branch, B.M.A.: Executive and Finance Committee.

### Editorial Notices.

MANUSCRIPTS forwarded the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

All communications should be addressed to "The Editor," THE MEDICAL JOURNAL OF AUSTRALIA, B.M.A. Building, 30-34, Elizabeth Street, Sydney. (Telephone: B. 4635.)

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